BANK NEGARA MALAYSIA
CENTRAL BANK OF MALAYSIA

Capital Adequacy Framework (Basel II – Risk-Weighted Assets)

Issued on: 3 May 2019

PART A OVERVIEW 1

A.1 EXECUTIVE SUMMARY 1

A.2 APPLICABILITY 3

A.3 LEGAL PROVISION 3

A.4 LEVEL OF APPLICABILITY 3

PART B CREDIT RISK 5

B.1 INTRODUCTION 5

B.2 THE STANDARDISED APPROACH FOR CREDIT RISK . 8

B.2.1 EXTERNAL CREDIT ASSESSMENTS 8

B.2.2 DEFINITION OF EXPOSURES 11

Exposures to Sovereigns and Central Banks 12

Exposures to Non-Federal Government Public Sector Entities (PSEs) 13

Exposures to Multilateral Development Banks (MDBs) 14

Exposures to Banking Institutions and Corporates 14

Exposures to Insurance Companies, Securities Firms and Fund Managers 16

Exposures Included in the Regulatory Retail Portfolio 16

Loans Secured by Residential Properties 17

Defaulted Exposures 20

Higher Risk Assets 21

Other Assets 21

B.2.3 TREATMENT FOR THE COMPUTATION OF CREDIT RISK-WEIGHTED ASSETS FOR ISLAMIC CONTRACTS 22

MURĀBAHAH 23

BAI' BITHAMAN AJIL (BBA) AND BAI' INAH 25

SALAM 25

ISTISNĀ` 27

IJĀRAH 28

MUSHĀRAKAH 30

MUDĀRABAH 34

SUKŪK 36

QARDH 37

B.2.4 OFF-BALANCE SHEET ITEMS 38

B.2.5 CREDIT RISK MITIGATION 40

Minimum Conditions for the Recognition of Credit Risk Mitigation Techniques 41

Credit Risk Mitigation Techniques 42

Other Aspects of Credit Risk Mitigation 66

B.3 THE INTERNAL RATINGS BASED APPROACH 69

B.3.1 ADOPTION OF THE IRB APPROACH 69

Adoption of IRB Across Asset Classes 69

Adoption of IRB for Islamic Banking Assets 72

Implementation Timelines and Transition Period 73

Determination of Capital Requirements under the IRB approach 75

B.3.2 CATEGORIES OF EXPOSURES 77

Definition of Corporate Exposures, including Specialised Lending 77

Definition of Bank Exposures 81

Definition of Retail Exposures 81

Definition of Equity Exposures 84

Definition of Purchased Receivables Exposures 85

B.3.3 RISK COMPONENTS 88

Risk Components for Corporate, Sovereign and Bank Exposures 88

Risk Components for Retail Exposures 97

Risk Components for Equity Exposures 99

B.3.4 CREDIT RISK MITIGATION (CRM) 100

Minimum Conditions for the Recognition of Credit Risk Mitigation Techniques 101

Collateralised Transactions 102

Guarantees and Credit Derivatives 115

On-Balance Sheet Netting 124

Other Aspects of Credit Risk Mitigation 125

B.3.5 RISK-WEIGHTED ASSETS 128

Risk-Weighted Assets for Corporate, Sovereign and Bank Exposures 128
Risk-Weighted Assets for Retail Exposures 132
Risk-Weighted Assets for Equity Exposures 134
Risk-Weighted Assets for Purchased Receivables 139
Risk-Weighted Assets for Leasing 143

B.3.6 CALCULATION OF MINIMUM CAPITAL REQUIREMENT. 144
Regulatory Capital 144
Calculation of Expected Losses 145
Calculation of Provisions 147
Risk-Weighted Assets 147
Parallel Calculation 148
Prudential Capital Floor 148

B.3.7 MINIMUM REQUIREMENTS FOR THE IRB APPROACH 149
Rating System Design 151
Rating System Operation 163
Risk Estimation 168
Governance, Oversight and Use of Internal Ratings 197
Validation of Rating Systems and Internal Estimates 203

B.3.8 QUALIFICATION 211
Overview of Approval and Review Process 211
General Qualification Process 211
Home-Host Supervisory Issues 212
Changes to IRB Implementation and Adoption 213

PART C OPERATIONAL RISK 215

C.1 INTRODUCTION 215

C.1.1 SOUND PRACTICES FOR OPERATIONAL RISK MANAGEMENT 215

C.1.2 TOTAL OPERATIONAL RISK CAPITAL CHARGE 216

C.2 THE BASIC INDICATOR APPROACH (BIA) 217

C.3 THE STANDARDISED APPROACH AND ALTERNATIVE STANDARDISED APPROACH 220

C.3.1 THE STANDARDISED APPROACH (TSA) 220

C.3.2 THE ALTERNATIVE STANDARDISED APPROACH (ASA) 224

PART D MARKET RISK 227

D.1 INTRODUCTION 227

Scope of the Capital Charges 227

Approaches of Measuring Market Risks 228

Standardised Approach 228

Internal Models Approach 228

D.1.1 PRUDENT VALUATION GUIDANCE 229

Systems and Controls 229

Valuation Methodologies 230

Independent Price Verification 231

Valuation Adjustments 232

D.1.2 CLASSIFICATION OF FINANCIAL INSTRUMENTS 232

Trading Book Policy Statement 232

Definition of Trading Book 234

Classification of Specific Financial Instruments 236

D.1.3 TREATMENT OF MONEY MARKET INSTRUMENTS IN TRADING BOOK 236

Controls to Prevent Regulatory Capital Arbitrage 237

Treatment of Hedging Positions 238

D.1.4 TREATMENT OF COUNTERPARTY CREDIT RISK IN THE TRADING BOOK 240

Credit Derivatives 240

D.2 THE STANDARDISED MARKET RISK APPROACH ... 242

D.2.1 INTEREST/PROFIT RATE RISKS 242

Specific Risk 243

Specific Risk Capital Charges for Issuer Risk 243

Specific Risk Capital Charges for Positions Hedged by Credit Derivatives 245

General Interest/Profit Rate Risk 247

Offsetting of Matched Positions 248

Maturity Method 248
Vertical Disallowance 249
Horizontal Disallowance 250
Duration Method 251
Treatment of Interest/Profit Rate Derivatives, Repo and Reverse Repo Transactions 252
Example 1: Calculation of General Risk (Maturity Method) for Interest/Profit Rate Related Financial Instruments 259

D.2.2 EQUITY POSITION RISK 262
Specific and General Risk 262
Specific Risk 262
General Risk 263
Treatment of Equity Derivatives 265
Offsetting of Matched Equity Derivative Positions 265
Arbitrage 266
Example 2: Calculation of Equity Risk for Equity Arbitrage Strategies 267

D.2.3 FOREIGN EXCHANGE RISK (INCLUDING GOLD AND SILVER POSITIONS) 269
The Treatment of Structural Positions 269
Measuring the Exposure in a Single Currency 270
The Treatment of Interest/Profit, Other Income and Expenses in Foreign Currency 271
Measuring the Foreign Exchange Risk in a Portfolio of Foreign Currency Positions 272

D.2.4 COMMODITIES RISK 273
Simplified Approach 275
Maturity Ladder Approach 275
Models for Measuring Commodities Risk 277
Example 3: Maturity Ladder Approach for Commodities Risk 278

D.2.5 TREATMENT OF OPTIONS 281
Underlying Position Approach 281
Simplified Approach 283
Delta-Plus Method 284
Scenario Approach 287

Example 4: Delta-Plus Methods for Options.....289
Example 5: The Scenario Approach for Options 296

D.3 INTERNAL MODELS APPROACH 300

D.3.1 COMBINATION OF INTERNAL MODELS AND THE STANDARDISED MARKET RISK MEASUREMENT APPROACH.....301

D.3.2 QUALITATIVE STANDARDS.....303

D.3.3 QUANTITATIVE STANDARDS 306

D.3.4 SPECIFICATION OF MARKET RISK FACTORS.....308

D.3.5 MODELLING OF SPECIFIC RISK.....311

D.3.6 STRESS TESTING 316

D.3.7 MODEL VALIDATION STANDARDS 318

D.3.8 MODEL REVIEW 320

D.3.9 FRAMEWORK FOR THE USE OF BACK TESTING 321

PART E LARGE EXPOSURE RISK REQUIREMENTS.....330

E.1 LERR FOR BANKING INSTITUTIONS 330

E.2 LERR FOR INVESTMENT BANKS 331

PART F SECURITISATION FRAMEWORK 332

F.1 INTRODUCTION.....332

F.2 OPERATIONAL REQUIREMENTS FOR CAPITAL RELIEF 334

F.2.1 Operational Requirements for Traditional Securitisations.....335

F.2.2 Operational Requirements for Synthetic Securitisations 336

F.3 STANDARDISED APPROACH FOR SECURITISATION EXPOSURES.....338

F.3.1 TREATMENT OF ON-BALANCE SHEET SECURITISATION EXPOSURES.....338

F.3.2 TREATMENT OF OFF-BALANCE SHEET SECURITISATION EXPOSURES.....340

F.3.3 TREATMENT OF OVERLAPPING EXPOSURES 341

F.3.4 TREATMENT OF COUNTERPARTY CREDIT RISK FOR SECURITISATION EXPOSURES 341

F.3.5 TREATMENT OF SECURITISATION OF REVOLVING UNDERLYING EXPOSURES WITH EARLY AMORTISATION PROVISIONS 342

F.3.6 TREATMENT OF CREDIT RISK MITIGATION FOR SECURITISATION EXPOSURES 347

F.4 INTERNAL RATINGS-BASED APPROACH FOR SECURITISATION EXPOSURES 348

F.5 OTHER OPERATIONAL REQUIREMENTS 349

F.5.1 OPERATIONAL REQUIREMENTS AND TREATMENT OF CLEAN-UP CALLS 349

F.5.2 TREATMENT FOR IMPLICIT SUPPORT 350

F.5.3 ELIGIBLE OFF-BALANCE SHEET SECURITISATION EXPOSURES 352

F.5.4 REQUIREMENTS FOR USE OF EXTERNAL RATINGS 354

PART G REQUIREMENTS FOR APPROVED FINANCIAL HOLDING COMPANIES 357

G.1 GENERAL REQUIREMENTS 357

G.2 Regulatory approval process for the adoption of an advanced approach 357

Appendix I Areas of National Discretion 360

Appendix II Eligibility Criteria for External Credit Assessment Institution (ECAI) Recognition 367

Appendix III Risk Weights and Rating Categories 373

Appendix IV Summary of Risk Weights for Loans Secured by Residential Mortgages 377

Appendix V Definition of Default 378

Appendix Va Diagrammatic Illustration of Re-ageing via Restructuring 381

Appendix VI Illustration on Risk-Weighted Asset (RWA) Calculation for Defaulted Exposures and Exposures Risk-Weighted at 150% 382

Appendix VII Minimum Requirements on Supervisory Slotting Criteria Method 384

Appendix VIIa Supervisory Slotting Criteria for Specialised Lending/Financing Exposures 389

Appendix VIII Counterparty Credit Risk and Current Exposure Method 411

Appendix VIIIa Sample Computation of the Capital Requirement and Exposure at Default (EAD) for a Portfolio of Derivative Contracts 419

Appendix VIIIb "Add-on" Factors for Derivatives Contracts 420

Appendix VIIIc Example for Calculation of Residual Maturity (for Forward Rate Agreements and Over-The-Counter Interest Rate Contracts of Similar Nature which are Settled in Cash on Start Date) 423

Appendix VIIId Discount Factor and Range of Residual Maturity 424

Appendix IX Capital Treatment for Failed Trades and Non-DvP Transactions 425

Appendix X List of Recognised Exchanges* 430

Appendix XI Recognition Criteria for Physical Collateral Used For Credit Risk Mitigation Purposes of Islamic Banking Exposures 432

Appendix XII Summary Table of Gross Income Computation 438

Appendix XIII Mapping of Business Lines 440

Appendix XIV Illustration of the Offsetting Rules Between Negative and Positive OR Capital Charge in Any Business Lines. 441

Appendix XV Illustration of Computation of Exposures with Credit Risk Mitigation Effects 442

Appendix XVI Information Requirements for Application to Adopt the Internal Ratings Based Approach for Credit Risk 447

Appendix XVII Information Requirements for Application to Adopt the Internal Models Approach for Market Risk 450

Appendix XVIII Illustration of Computation of Large Exposure Risk Requirement 456

Appendix XIX Capital Treatment for Sell and Buyback Agreement (SBBA)/ Reverse SBBA Transactions 458

Appendix XX Securitisation Framework – Definitions and General Terminology 461

Appendix XXI Legal and Regulatory Requirements 466

Appendix XXII IRB Coverage 470

Appendix XXIII Assessment of Credit Risk based on Shariah Contracts 472

Appendix XXIV Capital Treatment for Investment Accounts 484

Appendix XXV Transitional Arrangements and Approval Process ... 487

Appendix XXVI Credit Conversion Factors for Off-Balance Sheet Items under the IRB Approach 492

Appendix XXVII Illustrative IRB Risk Weights 494

Appendix XXVIII Potential Evidence of Likely Compliance with the Use Test 497

Appendix XXIX Data-Enhancing and Benchmarking Tools 498

Appendix XXX Illustration on the Treatment of Underwriting Exposures 502

Appendix XXXI Treatment of Credit Derivatives in the Trading Book 504

PART A OVERVIEW

A.1 EXECUTIVE SUMMARY

1.1 This document is part of the Capital Adequacy Framework that specify the approaches for quantifying the Risk-Weighted Assets (RWA) for credit risk, market risk and operational risk, as follows:

	Risk Type	Available Approaches
1.	Credit	▪ Standardised Approach ▪ Internal Ratings Based Approach*(IRB)
2.	Market	▪ Standardised Approach ▪ Internal Models Approach* (IMA)
3.	Operational	▪ Basic Indicator Approach (BIA) ▪ Standardised Approach* (TSA) ▪ Alternative Standardised Approach* (ASA)
* Subject to explicit approval by Bank Negara Malaysia (the Bank). For IRB Approach, only applicable for adoption from 1 January 2010.		

It should be read together with *Capital Adequacy Framework (Capital Components)*.

1.2 The computation of the risk-weighted assets is consistent with Pillar 1 requirements set out by the Basel Committee on Banking Supervision (BCBS) and the Islamic Financial Services Board (IFSB) in their respective documents - "*International Convergence of Capital Measurement and Capital Standards: A Revised Framework*" issued in June 2006 and the "*Capital Adequacy Standard (CAS)*" issued in December 2005. **Appendix I** summarises the options exercised by the Bank in areas where national discretion is provided by the BCBS to the national supervisory authority.

1.3 The requirements set out by the BCBS are intended to improve the overall risk sensitivity of the capital adequacy framework. However, they may not be sufficient to reflect the actual risk profile of banking institutions operating in emerging markets. As such, the Bank had proposed some customisations to the BCBS specification in an effort to avoid under estimation of risk within the

industry as well as to ensure suitability of the framework in the local environment.

1.4 While the Bank believes that such customisation could be justified, a pragmatic approach is adopted for implementation. Higher prudential requirements and risk management standards would be introduced gradually taking into consideration industry feedback during the consultation process. Similarly, prioritisation and timing for the introduction of additional adjustments or customisation would be determined based on the long-term benefits of promoting prudent practices within the industry.

1.5 As we gain more reliable data and experience over time, a more thorough assessment would also be undertaken to consider the introduction of other adjustments as deemed necessary by the Bank. In view of these potential future developments, it is important that banking institutions make well-informed decisions with respect to the adoption of the approaches specified under this framework having considered the appropriateness to cater for the complexity of their current business models, as well as future business and risk management strategies. It is also important to emphasise that the Bank may also exercise its discretion under the Supervisory Review Process, or Pillar 2 to impose higher capital requirements or prudential standards on individual institutions if the Bank is of the view that the actual risk profiles of these institutions are significantly underestimated by the framework or the internal capital allocation processes are not satisfactory.

1.6 Notwithstanding the requirements under the capital adequacy framework, a fundamental supervisory expectation is for all banking institutions to have in place comprehensive risk management policies and processes that effectively identify, measure, monitor and control risks exposures of the institution and is subjected to appropriate board and senior management oversight. This supervisory expectation is further detailed in the *'Risk Management Guidelines'* and other relevant risk management standards and requirements set by the Bank. The assessment on the adherence to the

standards and requirements set by the Bank would be a key component of the overall supervisory review process in determining appropriate supervisory actions against banking institutions.

A.2 APPLICABILITY

1.7 The framework is applicable to

i) all banking institutions licensed under the Financial Services Act 2013 (FSA). These institutions will hereafter be referred to as "banking institutions"; and

ii) all financial holding companies (FHCs) approved under the FSA which are engaged predominantly in banking activities. The requirements for FHCs are set out in part G.

A.3 LEGAL PROVISION

1.8 The framework is issued pursuant to section 47(2), section 115 and section 143(2) of the FSA.

A.4 LEVEL OF APPLICABILITY

1.9 A banking institution is required to comply with the Capital Adequacy Framework at the following levels:

i) Entity level[1], referring to the global operations of the banking institution (i.e. including its overseas branch operations) on a standalone basis, and including its Labuan banking subsidiary; and

ii) Consolidated level, which includes entities covered under the entity level requirement, and the consolidation[2] of all subsidiaries[3], except

[1] Also referred to as the "solo" or "stand-alone" level.

[2] In accordance with Malaysian Financial Reporting Standards (MFRS).

[3] Financial and non-financial subsidiaries. A financial entity refers to any entity, whether incorporated in Malaysia or otherwise, engaged substantively in, or acquiring holdings in other entities engaged substantively in, any of the following activities: banking, provision of credit, securities broking, fund management, asset management, leasing and factoring and similar activities that are ancillary to the conduct of these activities.

insurance and takaful subsidiaries which shall be deducted in the calculation of Common Equity Tier 1 Capital[4].

1.10 In addition, a banking institution carrying on *Skim Perbankan Islam*[5] (hereafter referred to as an SPI), shall comply with the requirements under the *Capital Adequacy Framework for Islamic Banks (Risk-Weighted Assets)* at the level of an SPI, as if the SPI is a stand-alone Islamic banking institution.

4 In accordance with paragraph 30 of *Capital Adequacy Framework (Capital Components).*
5 In accordance with section 15 of the FSA and the Guidelines on *Skim Perbankan Islam*.

PART B CREDIT RISK

B.1 INTRODUCTION

2.1 This part outlines the two approaches available for the computation of the capital requirements for credit risk, namely the standardised approach and the IRB approach.

2.2 Under the standardised approach for credit risk, the determination of the capital requirements is based on an approach that links predefined risk weights to predefined sets or classes of assets as defined from paragraph 2.13 to 2.45 of this framework. Significant differences to the current framework are in the following areas:

- The use of external ratings issued by recognised external credit assessment institutions (ECAIs) in determining the risk weights of the banking institutions' exposures to certain types of borrowers/ counterparties, such as corporates and banking institutions. The use of such ratings are subject to specific rules set out from paragraphs 2.3 to 2.12;
- Greater recognition of credit risk mitigation in the form of on-balance sheet netting arrangements, credit protection through financial collateral as well as guarantees and credit derivatives; and
- The introduction of new portfolio segments and risk weights. A retail portfolio segment with a risk weight of 75% has been introduced under the standardised approach. In addition, the residential mortgage portfolio has also been divided into three as compared to only one risk weight available under the current framework. Nevertheless, the application of these risk weights will be subject to the banking institutions fulfilling all the specified operational requirements.

Whilst the standardised approach specifies the applicable risk weight for a particular exposure, as a general rule under Pillar 2, the Bank reserves the right to exercise its discretion to apply a different risk weight to a particular banking institution or group of banking institutions, (which may be higher)

from that specified under this framework in certain circumstances such as in situations where there is enough evidence to suggest that loss experience in a particular band or asset class had increased or that overall asset quality of such institutions have been deteriorating.

2.3 For the IRB approach, the capital requirements are derived using banking institution's internal rating systems. Banking institutions that wish to adopt the IRB approach are required to obtain explicit approval from the Bank prior to implementation.

2.3(i) The IRB approach is based largely on the value-at-risk (VaR) methodology to measuring credit risk and is therefore more risk-sensitive compared to the standardised approach. Under this approach, the capital requirement is determined using certain supervisory parameters and banking institutions' own estimates that are calibrated to a predetermined risk weight function.

2.3(ii) The flexibility given to banking institutions to use own estimates is premised on employment of sound risk management practices and strong risk management capabilities and infrastructure. Only banking institutions that meet these supervisory requirements and expectations would be allowed to adopt the IRB approach.

2.3(iii) The IRB approach is developed based on the following principles:

i) Differentiation between the foundation and advanced approach. The foundation approach relies on banking institutions' internal estimates of probabilities of default (PD) and applies supervisory estimates of loss given default (LGD) and exposure at default (EAD), while the advanced approach, relies on mostly internal estimates.

ii) Banking institutions being allowed to adopt a wider range of credit risk mitigation techniques, subject to requirements set by the Bank.

Under the foundation approach, in addition to the financial collateral available under the standardised approach, non-financial collateral including commercial and residential real estate, financial receivables and other physical collateral are also available as risk mitigants, subject to meeting specific operational requirements. More flexibility is allowed under the advanced approach as there is no limit to the type of collateral recognised.

iii) The determination of capital requirement is based on the unexpected losses (UL) approach. The risk weight formulas used to calculate capital requirement for UL are derived from a specific model developed by the BCBS. The UL approach is based on the concept that capital is only required to cover UL which are peak losses that occur infrequently over a long economic cycle. The expected losses (EL) are the average anticipated credit losses over time that in most cases would have been covered by provisions. Based on this premise, any excess of provisioning over the EL would be recognised as part of the banking institution's Tier 2 Capital.

iv) Standard capital computation formula being applied for each exposure class on the premise that banking institutions have complementing internal rating systems that meet high standards of integrity and rigour based on minimum requirements specified by the Bank. The requirements also necessitate the integration of the IRB measures into the day-to-day risk management processes, forming the foundation for a sound credit culture. Banking institutions' adherence to the minimum requirements will be monitored by the Bank through its supervisory processes.

2.3(iv) The treatment to be adopted in areas where national discretion is provided by the BCBS to the national supervisory authority is summarised in **Appendix I**.

B.2 THE STANDARDISED APPROACH FOR CREDIT RISK

B.2.1 EXTERNAL CREDIT ASSESSMENTS

2.4 External credit assessments (or external ratings) on the borrower (the issuer) or specific securities issued by the borrower (the issue) are the basis for the determination of risk weights under the standardised approach for exposures to sovereigns, central banks, public sector entities, banks, corporates as well as certain other specific portfolios. For this purpose, banking institutions are only allowed to use external ratings provided by ECAIs that have been recognised by the Bank[6] based on the eligibility criteria as stipulated in **Appendix II**. External ratings are not used for determining the risk weights for residential mortgages, regulatory retail portfolios, non-performing loans, high risk exposures as well as specifically identified borrowers/transactions as specified in paragraph 2.44 and any other assets not specified as mentioned in paragraph 2.45.

2.5 Under this framework, an exposure would be deemed to have an external rating if the issuer or the issue has a rating provided by an external credit assessment institution (ECAI) that has been recognised by the Bank. In cases where an exposure does not have an issuer or issue rating, the exposure shall be deemed unrated and shall be accorded a risk weight appropriate for unrated exposures in their respective exposure category. However, there may be instances where an unrated exposure can be risk-weighted based on the rating of an equivalent exposure to the particular borrower. The treatment of these unrated exposures will be subject to conditions specified in paragraph 2.9.

[6] A list of recognised ECAIs, including the mapping of the rating categories of different ECAIs to the risk weights, is provided in **Appendix III** and shall be updated from time to time.

General Requirements on the Use of External Ratings

2.6 The use of external ratings for capital adequacy purposes must be applied on a consistent basis. In addition, there should not be 'cherry picking[7]' of external ratings. Banking institutions must ensure that:

- external rating announcements are closely monitored (especially for borrowers which are placed under 'watch' by the ECAIs);
- risk weights are revised promptly following any changes in external ratings; and
- all reports on the capital adequacy position under this framework that are submitted to the Bank reflect the latest ratings assigned to the issuers or issues.

The use of external ratings for risk weighting of exposures would also be subject to the disclosure requirements under Pillar 3, failing which the external ratings shall not be used for purposes of capital adequacy computation. In this event, all exposures shall be treated as being unrated.

Level of Application of the Assessment

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

Single and Multiple Assessments

2.8 There are cases where a borrower/securities issuer or securities are rated by more than one ECAI. In such cases, all available external ratings of a borrower or an issue from recognised ECAIs must be captured and the following rules must be observed:

- Where 2 recognised external ratings are available, the lower rating is to be applied; or

[7] Banking institutions shall not 'cherry pick' external ratings for capital adequacy purposes. For example, banking institutions should not use external ratings only when the ratings provide a favourable risk weight compared to an unrated exposure and ignore the external ratings in situations where the risk weight is unfavourable.

- Where 3 or more recognised external ratings are available, the lower of the highest 2 ratings will be used for the capital adequacy calculation purposes.

Issuer and Issues Assessment

2.9 Where a banking institution invests in a particular security which has an issue-specific rating, the risk weight for this exposure will be based on this rating assessment. Where the banking institution has an investment which does not have an issue-specific rating, the following principles shall apply:

- In the event where the banking institutions' exposure is to a counterparty which does not have its own issuer rating, but the same counterparty has a rating on other obligations such as a debt security which the banking institution is not exposed to, the banking institution is able to use that debt security rating in determining the appropriate risk weight for their exposure to the counterparty. However, this is subject to the condition that the banking institution's unrated exposure ranks *pari passu* or senior in all respects to the debt security which has a rating and the debt security rating has not taken into account any effects of collateral/guarantee arrangements. Otherwise, the unrated exposure will receive the risk weight for unrated exposures;
- Where a counterparty has its own issuer rating, this assessment typically applies to senior unsecured exposures on that counterparty. Thus, only senior exposures on that counterparty will be able to utilise this rating. Other exposures will be treated as unrated; and
- In the event that either the counterparty or a single security has a low quality rating which maps into a risk weight equal to or higher (for example 150%) than that which applies to unrated exposures (100%), an unrated exposure on the same counterparty will be assigned the same risk weight as is applicable to the low quality rating (instead of the risk weight for unrated exposures).

2.10 No supervisory recognition of credit risk mitigation techniques will be taken into account if credit enhancements have already been reflected in the

rating specific to a particular debt security (to avoid double counting of credit enhancement factors). For example, if an external rating for a specific issue has already taken into account the effects of a guarantee attached to the issuance, the guarantee cannot be subsequently be taken into consideration for purposes of credit risk mitigation.

Domestic Currency and Foreign Currency Assessments

2.11 Where unrated exposures are risk-weighted based on the rating of an equivalent exposure to a particular borrower, foreign currency ratings would be used for exposures in foreign currency. Domestic currency ratings would only be used to risk weight unrated exposures denominated in domestic currency.

Unsolicited Ratings

2.12 Banking institutions should only use solicited ratings from recognised ECAIs for purposes of the capital adequacy computation under the standardised approach. This, however, does not preclude banking institutions from using unsolicited ratings for other internal risk management purposes.

B.2.2 DEFINITION OF EXPOSURES

2.13 The following part defines the various categories of exposures and their corresponding risk weights under the standardised approach. The risk weights would be applicable to all on-balance sheet and off-balance sheet exposures in the banking book of banking institutions. Exposures in the trading book shall be subject to the requirements under the market risk component of this framework. For exposures undertaken through the Islamic banking contracts, the treatment for the computation of the risk-weighted assets is provided in **Part B.2.3 Treatment for the Computation of Credit Risk-weighted Assets for Islamic Contracts**.

2.14 On-balance sheet exposures shall be multiplied by the appropriate risk weight to determine the risk-weighted asset amount, while off-balance sheet exposures shall be multiplied by the appropriate credit conversion factor (**Part B.2.4 Off-Balance Sheet Items**) before applying the respective risk weights.

2.15 For purposes of capital adequacy computation, exposures are defined as assets and contingent assets under the applicable Financial Reporting Standards, net of specific provisions[8].

Exposures to Sovereigns and Central Banks

2.16 Exposures to the Federal Government of Malaysia and the Bank[9], denominated and funded[10] in ringgit Malaysia (RM) shall be accorded a preferential risk weight of 0%. Any exposures in RM where there is an explicit guarantee provided by the Federal Government of Malaysia or the Bank shall also be accorded a 0% risk weight.

2.17 Where another national supervisor has accorded a preferential risk weight (that is 0% or 20%) for exposures to their sovereign (or central bank), denominated and funded in their domestic currency, banking institutions can also apply the preferential risk weight on these exposures. Similarly, where an explicit guarantee has been provided by these sovereigns (or central banks), the preferential risk weight can also be applied. However, in circumstances where the Bank deems the preferential risk weight to be inappropriate, the Bank reserves the right to require these sovereign exposures to be risk-weighted based on the sovereign's external rating.

---

8 Specific provisions refer to loss allowance measured at an amount equal to lifetime expected credit losses for credit-impaired exposures as defined under the Malaysian Financial Reporting Standards 9. These provisions are commonly known as Stage 3 provisions.

9 Including securities issued through special purpose vehicles established by the Bank e.g. Bank Negara Malaysia Sukuk Ijarah and BNMNi-*Murabahah* issued through BNM Sukuk Berhad. However, banking institutions shall apply the look-through approach as Appendix XXIV for BNM *Mudarabah* certificate (BMC).

10 This means that the banking institution has corresponding liabilities denominated in RM.

2.18 Exposures to sovereigns (or central banks) not falling under the categories set out in paragraphs 2.16 and 2.17[11], shall be risk-weighted based on the external credit rating of the sovereigns as given in **Appendix III.**

Exposures to Non-Federal Government Public Sector Entities (PSEs)

2.19 Exposures to domestic PSEs will be risk-weighted at 20% if all of the following criteria are met:

- the PSE has been established under its own statutory act;
- the PSE and its subsidiaries are not involved in any commercial undertakings;
- a declaration of bankruptcy against the PSE is not possible; and
- the PSE is mostly funded by the federal government and any lending facilities obtained by the PSE are subjected to strict internal lending rules by the PSE.

2.20 In general, domestic PSEs would include administrative bodies of the federal government as well as state governments, local governments and administrative bodies of these entities.

2.21 PSEs[12] that do not fulfill all criteria in paragraph 2.19 shall be risk-weighted based on their external ratings as per corporates *(*Refer to paragraph 2.24).

2.22 In cases where other national supervisors have accorded a preferential risk weight to their domestic PSEs, banking institutions can also apply the preferential risk weight on their exposures to these foreign PSEs provided these exposures are denominated and funded in their domestic currency. In addition, the criteria established by the national supervisor in determining the eligible PSEs for the preferential risk weight should also be aligned with the criteria specified above for domestic PSEs in Malaysia. However, in circumstances where the preferential risk weight to a foreign

[11] Such as bonds issued by Federal Government of Malaysia denominated in USD.
[12] This would include quasi-government agencies.

PSE is deemed inappropriate, the Bank reserves the right to require exposures to the PSE to be risk-weighted based on its external rating.

Exposures to Multilateral Development Banks (MDBs)

2.23 Exposures to MDBs shall in general be treated similar to exposures to banking institutions. However, highly-rated MDBs which meet certain criteria that have been specified by the BCBS will be eligible for a preferential risk weight of 0%[13].

Exposures to Banking Institutions and Corporates

2.24 Exposures to banking institutions and corporates shall be accorded risk weights based on their external ratings which can be in the form of either long-term or short-term ratings. However, any exposure arising from investment account placements made with Islamic banking institutions shall be subject to the 'look-through' approach as described in **Appendix XXIV**. As a general rule, no exposures to an unrated banking institution or corporate shall be given a risk weight preferential[14] to that assigned to its sovereign of incorporation.

Short-term Ratings

2.25 Short-term ratings[15] are deemed to be facility-specific, thus can only be used to determine risk weights for exposures specific to a rated facility. In addition, short-term ratings cannot be used to risk weight an unrated long-term exposure. The treatment for specific short-term facilities, such as a

[13] MDBs currently eligible for a 0% risk weight are the World Bank Group, which comprises the International Bank for Reconstruction and Development (IBRD) and the International Finance Corporation (IFC), the Asian Development Bank (ADB), the African Development Bank (AfDB), the European Bank for Reconstruction and Development (EBRD), the Inter-American Development Bank (IADB), the European Investment Bank (EIB), the European Investment Fund (EIF), the Nordic Investment Bank (NIB), the Caribbean Development Bank (CDB), the Islamic Development Bank (IDB), the Council of Europe Development Bank (CEDB), and the International Finance Facility for Immunisation (IFFIm).

[14] For example, if the sovereign rating for a particular country was BBB, any exposures to the sovereign would be accorded a risk weight of 50% and any unrated exposures to corporates incorporated in that sovereign would be assigned a risk weight of 50% or higher.

[15] In general, short-term ratings assessments refer to ratings for facilities with an original maturity of 1 year or less.

particular issuance of a commercial paper is given in **Appendix III**. In addition, the application of short-term ratings shall be guided by the following requirements:

- where a banking institution has multiple short-term exposures to a particular borrower and only one of these facilities has a short-term facility rating which attracts a 50% risk weight, other unrated short-term exposures on the borrower cannot attract a risk weight lower than 100%;
- where an issuer is accorded a risk weight of 150% for one short-term facility, all unrated exposures of the issuer, whether long-term or short term, shall also attract a 150% risk weight, unless a recognised credit risk mitigant is available; and
- the banking institution ensures that when a short-term rating is used, the ECAI making the assessment has met all of the eligibility criteria specified by the Bank in terms of its short-term rating. (i.e. the Bank has not communicated the withdrawal of such recognition).

All other exposures shall use the long-term ratings or be treated as unrated exposures.

Long-term Ratings

2.26 The applicable risk weights for long-term ratings for exposures to banking institutions and corporates are provided in **Appendix III**. The following treatment are specifically provided for exposures to banking institutions:

- a risk weight that is one category more favourable is applied to claims on banking institutions with an original[16] maturity of six (6) months or less, subject to a floor of 20%. This treatment is available to both rated and unrated exposures, but not to banking institutions risk-weighted at 150%; and

[16] Banking institutions must ensure that exposures which are expected to be rolled-over beyond their original maturity do not qualify for this more favourable treatment. This is based on the view that banking institutions rolling-over their facilities are having difficulty to source for alternative funding. This shall also be applicable for exposures that have been accorded the automatic 20% risk weight.

- a risk weight of 20% shall be applied to exposures to other banking institutions with an original maturity of three (3) months or less denominated and funded in RM.

2.27 Exposures on development financial institutions (DFIs) shall be treated similar to the exposures to banking institutions.

Exposures to Insurance Companies, Securities Firms and Fund Managers

2.28 Exposures to insurance companies, securities firms, unit trust companies and other asset management companies shall be treated as exposures to corporates.

Exposures Included in the Regulatory Retail Portfolio

2.29 Exposures included in the regulatory retail portfolio (excluding qualifying residential mortgage loans and defaulted regulatory retail exposures) shall be risk-weighted at 75% only when the following criteria are met:

- orientation criterion - exposure is to an individual person or persons or to a small business. (Small businesses may include sole-proprietorships, partnerships or small and medium-sized enterprises (SMEs[17]));
- 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 other term loans (for example installment loans, auto financing loans, student and educational loans, personal finance) and small business facilities. Investment in debt and equity securities, whether listed or not, are excluded from this portfolio. Qualifying residential mortgage loans would be treated separately under paragraphs 2.31 to 2.36.

[17] Small and medium-sized enterprises (SMEs) in the agriculture and services sector are defined as having annual sales of up to RM5 million or 50 full-time employees. For the manufacturing sector, SMEs have been defined as having annual sales of up to RM25 million or 150 full-time employees.

- granularity criterion[18] - the aggregate exposure[19] to a counterparty[20] (excluding qualifying residential mortgage loans) cannot exceed 0.2% of the overall regulatory retail portfolio;
- low value of individual exposures - the aggregate exposure[21] to one counterparty (excluding qualifying residential mortgage loans) cannot exceed RM5 million; and
- for Islamic banking assets, in addition to the above four criteria, regulatory retail exposures must be based on either *Murābahah* or *Ijārah* contracts[22].

2.29(i) Any term loans for personal use with an original maturity of more than 5 years approved and disbursed by banking institutions on or after 1 February 2011, shall be risk-weighted at 100%.

2.30 Where an exposure does not fulfill the criteria above, the exposure shall be treated as exposures to corporates.

Loans Secured by Residential Properties

2.31 Loans fully secured by mortgages on residential property[23], which are or will be occupied by the borrower, or is rented, shall be carved-out from the

[18] At minimum, banking institutions must undertake a one-off computation on a monthly basis to fulfil this requirement. The computation requires banking institutions to aggregate all retail exposures which have fulfilled all other operational requirements for regulatory retail portfolio and ascertain whether all these exposures do not exceed the granularity threshold of 0.2%. If there are exposures which exceed this threshold, they would not be eligible for the 75% risk weight and shall be treated as a corporate exposure. However, banking institutions may wish to consider undertaking an iterative computation on an annual basis.

[19] Aggregate exposure means gross amount (excluding defaulted exposures and without taking into account credit risk mitigation effects) of all forms of debt exposures (including off-balance sheet exposures) that individually satisfy the other three criteria.

[20] "Counterparty" as defined under *Single Counterparty Exposure Limit*.

[21] Aggregate exposure means gross amount (inclusive of defaulted exposures but without taking into account credit risk mitigation effects) of all forms of debt exposures (including off-balance sheet exposures) that individually satisfy the other three criteria.

[22] Use of the risk weight under the regulatory retail portfolio for exposures based on other Islamic contracts may be allowed, provided that the credit risk profile of such exposures is similar to *Murābahah* or *Ijārah* contract.

[23] Residential property means property which is zoned for single-family homes, multi-family apartments, townhouses and condominiums. It excludes shop houses which can be eligible for the regulatory retail portfolio as per paragraph 2.29.

regulatory retail portfolio and defined as qualifying residential mortgage loans, if the following criteria are met:

- the borrower is an individual person;
- the loan is secured by the first legal charge, assignment or strata title on the property;
- the banking institution has in place a sound valuation methodology to appraise and monitor the valuation of the property;
- the re-computation[24] of the loan-to-value ratio must be undertaken at least on an annual basis. Banking institutions can also consider credit protection extended by Cagamas SRP Berhad when computing the loan-to-value ratio, by reducing the value of the loan by the amount protected. This is however, subject to banking institutions fulfilling the operational and legal certainty requirements for the recognition of credit risk mitigation set out in Part B.2.5;
- upon default, the property must be valued by a qualified independent valuer. (Defaulted qualifying residential mortgage loans would be treated differently from other defaulted loans. The treatment is specified under paragraph 2.40);
- the property has been completed and a certificate of fitness has been issued by the relevant authority ; and
- for Islamic banking assets, the exposures must be based on either *Murābahah* or *Ijārah* contract[25].

[24] The computation of LTV ratio for regulatory capital purpose shall be subject to the following:

- Banking institutions ensure that the loan amount is reflective of the banking instituion's potential or outstanding exposure to the borrower. Where the banking instituion for instance, has offered to extend the lending facility to cover additional costs to be incurred by the borrower in connection to the housing loan (e.g. for fire insurance, stamp duty fees, legal fees, Mortgage Reducing Term Assurance, etc.), these amounts should also be included in the loan amount.
- At origination, the value of the house will be based on the value stated on the Sales and Purchase Agreement. Subsequently, to qualify for concessionary risk weight, banking institutions have to demonstrate ability to comply with the valuation rules and annual recomputation of the loan-to-value ratio. Banking institutions should have in place internal policies and procedures to verify the robustness of the properly values used in the LTV computation, including where appropriate, requirements for independent valuations to be carried out to confirm the veracity of values stipulated in the Sales and Purchase Agreement. In computing the LTV ratio, banking institutions are not expected to conduct a formal valuation on each property annually. Banking institutions may use credible secondary information such as property market reports or house indices.

[25] The risk weights of qualifying residential mortgages may be applicable to exposures based on other contracts (including *Mushārakah Mutanaqisah* contracts undertaken with and without *Waad*),

2.32 Qualifying residential mortgage loans shall be risk-weighted[26] based on the following table:

Loan-to-value Ratio[27]	**<80%**	**80%-90%**
Risk weight	35%	50%

2.33 Residential mortgages which do not meet the criteria in paragraphs 2.31 and 2.32 will be treated as regulatory retail portfolio as per paragraph 2.29.

2.33(i) Notwithstanding paragraphs 2.31 to 2.33, all residential mortgages with a loan-to-value ratio of more than 90% approved and disbursed by banking institutions on or after 1 February 2011 shall be risk-weighted at 100%.

2.34 For residential mortgages which are combined with overdraft facilities, the overdraft facility shall be classified under the residential mortgage if the overdraft facility is secured with the first legal charge. Otherwise, the overdraft facility shall be classified under regulatory retail portfolio.

2.35 For residential mortgage loans extended to the priority sector as per requirements specified by the Bank, the loan shall be subjected to a risk weight of 50%, or 35% if the loan-to-value ratio is below 80%[28]. However, any loans with a loan-to-value ratio of more than 90% approved and disbursed by banking institutions on or after 1 February 2011, shall be risk-weighted at 75%.

2.36 A summary of the risk weights for all residential mortgage exposures is provided in **Appendix IV**.

---

provided that the credit risk profile of such exposures is similar to *Murābahah* or *Ijārah* contracts. Nevertheless, the Bank expects banking institutions to monitor the risk characteristics of such contracts in comparison against other similar types of exposures, particularly in relation to the recovery profile.

[26] Where the residential mortgage loan is protected by Cagamas SRP Berhad (under Cagamas MGP, *Skim Rumah Pertamaku*, and *Skim Perumahan Belia*), a risk weight of 20% shall apply on the protected portion while the remaining portion shall be risk-weighted based on the post protection loan-to-value ratios.

[27] The loan-to-value ratios are post-protection where applicable.

[28] Refer to footnote 26.

Defaulted Exposures

2.37 This part specifies the treatment for exposures classified as being in default. The definition of defaulted exposures is attached in **Appendix V**.

2.38 The risk weights for the unsecured portion of defaulted exposures (other than defaulted qualifying residential mortgage loans (refer to paragraph 2.40) and higher risk assets (refer paragraph 2.42)), net of specific provisions[29] (including partial write-offs) are as follows:

- 150% risk weight when specific provisions are less than 20% of the outstanding amount of the exposure;
- 100% risk weight when specific provisions are no less than 20% of the outstanding amount of the exposure; and
- 50% risk weight when specific provisions are no less than 50% of the outstanding amount of the exposure.

2.39 For defaulted exposures, similar eligible collateral and guarantees as non-defaulted exposures will be allowed for the purposes of determining the secured portion of defaulted exposures.

2.40 Qualifying residential mortgage loans that are in default shall be risk-weighted, net of specific provisions (including partial write-offs) as follows:

- 100% when specific provisions are less than 20% of the outstanding amount of the exposure; and
- 50% when specific provisions are 20% or more of the outstanding amount of the exposure.

2.41 An illustration on the computation of the risk-weighted assets for defaulted exposures is provided in **Appendix VI**.

[29] Specific provisions refer to loss allowance measured at an amount equal to lifetime expected credit losses for credit-impaired exposures as defined under the Malaysian Financial Reporting Standards 9. These provisions are commonly known as Stage 3 provisions.

Higher Risk Assets

2.42 The following exposures have been identified as high risk assets and are accorded specific risk weights as follows:

- non-publicly traded equity investments (includes investments structured based on *Mushārakah* or *Mudārabah* contracts) will be risk-weighted at 150%;
- residential mortgage loans for abandoned[30] housing development project or construction will be risk-weighted at 150%; and
- venture capital investments will be risk-weighted at 150%.[31]

2.43 In addition, the treatment for defaulted and non-defaulted exposures of these higher risk assets shall be the same.

Other Assets

2.44 Following are specific treatment for other assets not specified above:

i) Cash and gold[32] will be risk-weighted at 0%;

ii) Investments in the ABF Malaysia Bond Index Fund shall be risk-weighted at 0%;

iii) Exposures on the Bank for International Settlements, the International Monetary Fund, the European Central Bank and the European Community shall be accorded a 0% risk weight;

iv) Exposures (excluding equity investment specified in (vii) below) to CGC shall be accorded a 20% risk weight;

v) Exposures to local stock exchanges[33] and clearing houses shall be accorded a 20% risk weight;

vi) Investments in unit trust funds and property trusts funds[34] shall be risk-weighted at 100%;

---

30 For this purpose, abandoned housing project or construction is defined as follows: (i) A housing development project in which construction has continuously stopped for 6 months or more within or outside the completion period as per the Sales and Purchase Agreement (ii) The developer has no ability to proceed and complete the project due to financial insolvency (iii) the Ministry qualifies that the developer is no longer able to continues its responsibility as the developer.

31 The Bank may decide to impose more stringent capital treatment including capital deduction.

32 Refers to holding of gold bullion held in own vaults or on an allocated basis to the extent backed by bullion liabilities.

33 Refers to Bursa Malaysia Securities Berhad and Labuan Financial Exchange.

vii) Publicly traded equity investments held in the banking book shall be risk-weighted at 100%. In addition, equity investments called for by the Federal Government of Malaysia, Bank Negara Malaysia, Association of Banks in Malaysia, Association of Islamic Banking Institutions in Malaysia, or Malaysian Investment Banking Association[35] shall also receive a risk weight of 100%;

viii) Investment in equity of non-financial commercial subsidiaries will be accorded a 1250% risk weight;

ix) Investment in sukuk issued by the International Islamic Liquidity Management Corporation (IILM) will be risk-weighted in accordance with paragraph 2.25; and

x) Right-of-use (ROU) assets where the underlying asset being leased is a tangible asset will be accorded a 100% risk weight.

2.45 Any other assets not specified shall receive a standard risk weight of 100%.

B.2.3 TREATMENT FOR THE COMPUTATION OF CREDIT RISK-WEIGHTED ASSETS FOR ISLAMIC CONTRACTS

2.46 This part sets out the specific treatment for the computation of credit risk-weighted assets for **seven classes** of Islamic contracts undertaken by banking institutions. Some Islamic banking products may carry different titles and are structured with a certain degree of variations in terms of the contracts. As such, for the purpose of computing the risk-weighted asset amount, banking institutions are advised to focus on the risk structure and exposure of the products rather than the title and form.

---

[34] Includes Real Estate Investment Trusts.

[35] Such as Cagamas Berhad and Credit Guarantee Corporation Malaysia Berhad.

MURĀBAHAH

Murābahah

2.47 A *Murābahah* contract refers to an agreement whereby a banking institution sells to an obligor an asset that it has acquired at an agreed selling price between both parties. The agreed selling price is based on the acquisition cost (purchase price plus other direct costs) of the asset incurred by the banking institution and a profit margin agreed between the banking institution and its obligor. The *Murābahah* contract shall include the agreed repayment terms where the obligor is obliged to pay the selling price after taking delivery of the asset.

2.48 Banking institutions are exposed to credit risk in the event that the obligor fails to pay the agreed selling price in accordance with the agreed repayment terms under the *Murābahah* contract. Hence, banking institutions shall be subject to the capital charge for credit risk exposure once the asset is sold and payment is due to the banking institution.

Murābahah for Purchase Orderer (MPO)

2.49 A *Murābahah for Purchase Orderer* (MPO) contract refers to an agreement whereby a banking institution sells to an obligor at an agreed selling price, a specified type of asset that has been acquired by the banking institution based on an agreement to purchase (AP) by the obligor which can be binding or non-binding. The relevant legal recourse provided under the AP that requires the obligor to perform their obligation to purchase the underlying asset from the banking institution shall be a key determinant for the AP to be recognised as binding or non-binding. Thus, it is pertinent for banking institutions to ensure the adequacy and enforceability of the legal documentation under the MPO contract. The MPO contract shall include the agreed repayment terms where the obligor is obliged to pay the selling price after taking delivery of the asset.

2.50 The difference between a *Murābahah* transaction and an MPO transaction is that under a *Murābahah* contract, the banking institution sells an asset which is already in its possession, whilst in an MPO, the banking institution acquires an asset in anticipation that the asset will be purchased by the obligor.

2.51 Banking institutions are exposed to credit risk in the event that the obligor fails to pay the agreed selling price in accordance with the agreed repayment terms under the MPO contracts. Hence, banking institutions shall be subject to the capital charge for credit risk exposure once the asset is sold and payment is due to the banking institution.

2.51(i) For *MPO* with binding AP, banking institutions are exposed to credit risk in the event that the obligor (purchase orderer) defaults on its binding obligation to purchase the assets under the contract. In view of the adequate legal recourse that requires the obligor to purchase the asset at an agreed price, the credit risk exposure commences once the banking institution acquires the underlying asset. For non-binding MPO, the effect is similar to a *Murābahah* transaction.

2.51(ii) The following table summarises the treatment for the determination of risk weights of *Murābahah* and *MPO* contracts

Contract	**Applicable Stage of the Contract** (When banking institutions start providing for capital)	**Determination of Risk Weight**
Murābahah and MPO with non-binding AP	When sale of asset is completed and payment is due from the customer Note: Exposure is based on outstanding amount	Based on type of exposure as per **Part B.2.2 Definition of Exposures.**

Contract	Applicable Stage of the Contract (When banking institutions start providing for capital)	Determination of Risk Weight
MPO with binding AP	When asset is acquired by banking institution and available for sale (asset on balance sheet)[36] Note: Exposure is equivalent to the asset acquisition cost.	

BAI' BITHAMAN AJIL (BBA) AND BAI' INAH

2.52 For the purpose of this framework, the *Bai` Bithaman Ajil* (BBA) and *Bai` Inah* contracts are deemed to have similar transaction characteristics and financing effect as the *Murābahah* and MPO contract. The BBA involves the selling of an asset with deferred payment terms while Bai' Inah involves a sell and buy back agreement. An example of Bai' Inah is where an obligor sells to the banking institution an asset at a selling price that will be repaid on cash basis for the first leg of the agreement. On the second leg, the banking institution sells back the asset to the obligor on deferred payment terms to enable the financing transaction

SALAM

2.53 A *Salam* contract refers to an agreement whereby a banking institution purchases from an obligor a specified type of commodity, at a predetermined price, which is to be delivered on a specified future date in a specified quantity and quality. Banking institution as the purchaser of the commodity makes full payment of the purchase price upon execution of the *Salam* contract. Banking institutions are exposed to credit risk in the event that the obligor (commodity seller) fails to deliver[37] the paid commodity as per the agreed terms.

[36] Includes assets which are in possession due to cancellation of AP by customers.
[37] Delivery risk in a *Salam* contract is measured based on the commodity seller's credit risk.

2.54 In addition, a banking institution may also enter into a parallel *Salam* contract, which is a back-to-back contract to sell the commodity purchased under the initial *Salam* contract to another counterparty. This arrangement enables the banking institution to mitigate the risk of holding the commodity.

2.55 Islamic banking institutions undertaking the parallel *Salam* transaction are exposed to credit risk in the event that the purchaser fails to pay for the commodity it had agreed to purchase from the Islamic banking institution. Nevertheless, in the event of non-delivery of the commodity by the seller under the initial *Salam* contract, the Islamic banking institution is not discharged of its obligation to deliver the commodity to the purchaser under the parallel *Salam* contract.

2.55(i) For the purpose of computing the credit risk-weighted asset, the purchase price paid by banking institution to the seller of commodity in a *Salam* contract shall be assigned a risk weight based on the seller's external rating.

2.55(ii) The following table summarises the treatment for the determination of credit risk weights of *Salam* contracts:

Contract	**Applicable Stage of the Contract** (When banking institutions start providing capital)	**Determination of Risk Weight**
Salam	Banking institution is expecting delivery of the commodity after purchase price has been paid to seller Note: Exposure amount is equivalent to the payment made by banking institution	Based on type of exposure as per **Part B.2.2 Definition of Exposures.**
Salam with Parallel *Salam*	Similar to the above (The Parallel *Salam* does not extinguish requirement for capital from the first *Salam* contract)	Based on type of exposure as per **Part B.2.2 Definition of Exposures.**

ISTISNĀ`

2.56 An *Istisnā`* contract refers to an agreement to sell to or buy from an obligor an asset which has yet to be manufactured or constructed. The completed asset shall be delivered according to the buyer's specifications on a specified future date and at an agreed selling price as per the agreed terms.

2.57 As a seller of the under the *Istisnā`* contract, the banking institution is exposed to credit risk in the event that the obligor fails to pay the agreed selling price, either during the manufacturing or construction stage, or upon full completion of the asset.

2.58 As a seller, the banking institution has the option to manufacture or construct the asset on its own or to enter into a parallel *Istisnā`* contract to procure the asset from another party or, to engage the services of another party to manufacture or construct the asset. Under the parallel *Istisnā`* contract, as the purchaser of the asset, the banking institution is exposed to credit risk in the event that the seller fails to deliver the specified asset at the agreed time and in accordance with the initial *Istisnā`* ultimate buyer's specifications. The failure of delivery of completed asset by the parallel *Istisnā`* seller does not discharge the banking institution from its obligations to deliver the asset ordered by the obligor under the initial *Istisnā`* contract. Thus, the banking institution is additionally exposed to the potential loss of making good the shortcomings or acquiring the specified assets elsewhere.

2.59 The following table specifies the treatment for the determination of risk weights of *Istisnā`* contracts:

Contract	Applicable Stage of the Contract (When banking institutions start providing capital)	Determination of Risk Weight
Istisnā` and Parallel *Istisnā*	Unbilled and unpaid billed work-in-progress	Based on type of exposure as per **Part B.2.2 Definition of Exposures**; or Supervisory slotting criteria method subject to fulfilling minimum requirements as per **Appendix VII**.

IJĀRAH

Ijārah

2.60 *Ijārah* contracts refer to a lease agreement whereby the lessor transfers the right to use (or usufruct) of the leased asset to the lessee, for an agreed period and at an agreed consideration, in the form of lease rental. The lessor maintains ownership of the leased asset during the lease period under these contracts.

2.61 As the owner of the leased asset, banking institutions therefore assume all liabilities and risks pertaining to the leased asset including the obligation to restore any impairment and damage to the leased asset arising from wear and tear, as well as natural causes which are not due to the lessee's misconduct or negligence.

2.62 As a lessor, banking institutions may acquire the asset to be leased based on the lessee's specifications as stipulated under the agreement to lease (AL), prior to entering into the *Ijārah* contract with the lessee. The AL can be binding or non-binding on the lessee depending on the legal recourse in the AL, which states the obligation for the lessee to lease the specified asset from the lessor.

2.63 Banking institutions as the lessor under the *Ijārah* contracts are exposed to the credit risk of the lessee in the event that the lessee fails to pay the rental amount as per the agreed terms.

2.64 In addition, under a binding AL, banking institutions are exposed to credit risk in the event that the lessee (lease orderer) defaulting on its binding obligation to execute the *Ijārah* contract. In this situation, the banking institution may lease or dispose off the asset to another party. However, the banking institution is also exposed to the credit risk of the lessee if the lessee is not able to compensate for the losses incurred arising from the disposal of the asset.

2.65 Under a non-binding AL, the banking institution is not exposed to the risk of non-performance by the lease orderer given that the banking institution does not have legal recourse to the lease orderer. In this regard, credit risk exposure arises upon the commencement of rental agreement.

Ijārah Muntahia Bittamleek

2.66 *Ijārah Muntahia Bittamleek* (IMB) contract refers to a lease agreement similar to *Ijārah* contracts. However, in addition to paragraphs 2.53 to 2.58, the lessor has an option to transfer ownership of the leased asset to the lessee in the form of a gift or a sale transaction at the end of IMB.

Al-Ijārah Thumma Al-Bai`

2.67 *Al-Ijārah Thumma Al-Bai`* (AITAB) contract is a type of IMB contract that ends with a transfer of ownership to the lessee by way of a sale transaction and shall be treated similarly to the IMB contract for purposes of capital adequacy requirements. In line with the applicable accounting treatment, where Islamic financial products apply the AITAB contract for the purpose of creating financing facilities, the outstanding rental amount refers to the total outstanding principal amount plus accrued profit due from obligor.

2.67(i) The following table summarises the treatment for the determination of risk weights of *Ijārah*/*IMB* contracts for the lessee:

Type of AL	Applicable Stage of the Contract (When banking institutions start providing capital)		Determination of Risk Weight
	Upon signing an AL and asset is in balance sheet available for lease	**Upon signing an LC and the lease rental payments are due from the lessee**	
Binding	Exposure to credit risk Note: Exposure is equivalent to asset acquisition cost	Exposure to credit risk Note: Exposure is based on outstanding rental amount	Risk weight is based on customer's (prospective lessee's) external rating
Non-binding / Without AL	No credit risk	Exposure to credit risk Note: Exposure is based on outstanding rental amount	Risk weight is based on lessee's external rating

MUSHĀRAKAH

2.68 A *Mushārakah* contract is an agreement between a banking institution and its obligor to contribute an agreed proportion of capital funds to an enterprise or to acquire ownership of an asset/real estate. The proportion of the capital investment may be on a permanent basis or, on a diminishing basis where the obligor progressively buys out the share of the banking institution (thus, this contract is named Diminishing *Mushārakah,* which is categorised under *Mushārakah* contract for the purpose of this framework). Profits generated by the enterprise or an asset/real estate are shared in accordance to the terms of the *Mushārakah* agreement, while losses are shared based on the capital contribution proportion.

2.69 In general, *Mushārakah* contracts can broadly be classified into two categories as follows:

- Equity participation in a private commercial enterprise to undertake business ventures or financing of specific projects; and
- Joint ownership in an asset or real estate.

I. EQUITY PARTICIPATION IN A PRIVATE COMMERCIAL ENTERPRISE TO UNDERTAKE BUSINESS VENTURES OR FINANCING OF SPECIFIC PROJECTS

2.70 A banking institution may enter into a *Mushārakah* contract with their obligor to provide an agreed amount of capital for the purpose of participating in the equity ownership of an enterprise. In this arrangement, the banking institution is exposed to capital impairment risk in the event that the business activities undertaken by the enterprise incur losses. The *Mushārakah* agreement may provide an agreed 'exit mechanism' which allows partners to divest their interest in the enterprise at a specified tenor or at the completion of the specified project. In this regard, the banking institution must ensure that the contract clearly stipulates the exit mechanism for partners to redeem their investment in this entity.

2.70(i) Banking institutions that enter into this type of *Mushārakah* contract are exposed to the risk similar to an equity holder or a joint venture arrangement where the losses arising from the business venture are to be borne by the partners. As an equity investor, the banking institution serves as the first loss absorber and its rights and entitlements are subordinated to the claims of creditors. In terms of risk measurement, the risk exposure to an enterprise may be assessed based on the performance of the specific business activities undertaken by the joint venture as stipulated under the agreement.

II. JOINT OWNERSHIP IN AN ASSET OR REAL ESTATE

2.71 *Mushārakah* contracts that are undertaken for the purpose of joint ownership in an asset or real estate may generally be classified into the two categories as follows:

i) *Mushārakah* contract with an *Ijārah* sub-contract

(a) Partners that jointly own an asset or real estate may undertake to lease the asset to third parties or to one of the partners under

an *Ijārah* contract and therefore generate rental income to the partnership. In this case, the risk profile of the *Mushārakah* arrangement is essentially determined by the underlying *Ijārah* contract. Banking institutions are exposed to credit risk in the event that the lessee fails to service the lease rentals.

ii) *Mushārakah* contract with a *Murābahah* sub-contract

(a) As a joint owner of the underlying asset, banking institutions are entitled to a share of the revenue generated from the sale of asset to a third party under a *Murābahah* contract. Banking institutions are exposed to credit risk in the event the buyer or counterparty fails to pay for the asset sold under the *Murābahah* contract.

iii) Diminishing *Mushārakah*

(a) A banking institution may enter into a Diminishing *Mushārakah* contract with an obligor for the purpose of providing financing based on a joint ownership of an asset, with the final objective of transferring the ownership of the asset to the obligor in the contract.

(b) The contract allows the obligor to gradually purchase the banking institution's share of ownership in an asset/real estate or equity in an enterprise over the life of the contract under an agreed repayment terms and conditions which reflect the purchase consideration payable by the obligor to acquire the banking institution's share of ownership.

(c) As part of the mechanism to allow the obligor to acquire the banking institution's share of ownership, the banking institution and obligor may agree to lease the asset/real estate to the obligor. The agreed amount of rental payable can be structured to reflect the progressive acquisition of the banking institution's share of ownership by the obligor. Eventually, the full ownership

of the asset will be transferred to the obligor as it continues to service the rental payment. In this regard, the banking institution is exposed to credit risk similar to an exposure under the *Mushārakah* with *Ijārah* contract.

(d) However, if the exposure under the Diminishing *Mushārakah* contract consists of share equity in an enterprise, the banking institution shall measure its risk exposure using the treatment for equity risk.

2.71(i) The following table specifies the treatment for the determination of credit risk weights of *Mushārakah* contracts:

Contract	**Applicable Stage of the Contract** (When banking institutions start providing capital)	**Determination of Risk Weight**
Mushārakah for equity holding in banking book	Holding of equity	100% risk weight for publicly traded equity and 150% risk weight for non-publicly traded equity; or Supervisory slotting criteria method subject to fulfilling minimum requirements as per **Appendix VII**.
Mushārakah for project financing	Funds advanced to joint venture	150% risk weight[38]; or Supervisory slotting criteria method subject to fulfilling minimum requirements as per **Appendix VII**.
Mushārakah with sub-contract	Exposure to credit risk	As set out under the sub-contract.

[38] The Bank reserves the right to increase the risk weight if the risk profile of the exposure is deemed higher.

MUDĀRABAH

2.72 A *Mudārabah* contract is an agreement between a banking institution and an obligor whereby the banking institution contributes a specified amount of capital funds to an enterprise or business activity that is to be managed by the obligor as the entrepreneur *(Mudārib).* As the capital provider, the banking institution is at risk of losing its capital investment (capital impairment risk) disbursed to the *Mudārib*. Profits generated by the enterprise or business activity are shared in accordance with the terms of the *Mudārabah* agreement whilst losses are borne solely by the banking institution (capital provider)[39]. However, losses due to misconduct, negligence or breach of contracted terms[40] by the entrepreneur, shall be borne solely by the *Mudārib*. In this regard, the amount of capital invested by the banking institution under the *Mudārabah* contract shall be treated similar to an equity exposure.

2.73 *Mudārabah* transactions can be carried out:

- on a restricted basis, where the capital provider authorises the *Mudārib* to make investments based on a specified criteria or restrictions such as types of instrument, sector or country exposures; or
- on an unrestricted basis, where the capital provider authorises the *Mudārib* to exercise its discretion in business matters to invest funds and undertake business activities based on the latter's skills and expertise.

2.74 In addition, transactions involving *Mudārabah* contracts may generally be sub-divided into two categories as follows:

[39] Losses borne by the capital provider would be limited to the amount of capital invested.
[40] Banking institutions are encouraged to establish and adopt stringent criteria for definition of misconduct, negligence or breach of contracted terms.

I. EQUITY PARTICIPATION IN AN ENTITY TO UNDERTAKE BUSINESS VENTURES

2.75 This type of *Mudārabah* contract exposes the banking institution to risks akin to an equity investment, which is similar to the risk assumed by an equity holder in a venture capital or a joint-venture investment. As an equity investor, the banking institution assumes the first loss position and its rights and entitlements are subordinated to the claims of creditors.

II. INVESTMENT IN PROJECT FINANCE

2.76 The banking institution's investment in the *Mudārabah* contract with a *Mudārib* is for the purpose of providing bridging finance to a specific project. This type of contract exposes the banking institution to capital impairment risk in the event that the project suffers losses. Under this arrangement, the banking institution as an investor provides the funds to the construction company or *Mudārib* that manages the construction project and is entitled to share the profit of the project in accordance to the agreed terms of the contract and must bear the full losses (if any) arising from the project.

2.77 There may be situations where the risk profile of money market instruments based on *Mudārabah* contracts may not be similar to an equity exposure given the market structure and regulatory infrastructure governing the conduct of the market. In particular, *Mudārabah* interbank investments in the domestic Islamic money market would attract the credit risk of the banking institution instead of equity risk despite having similarities in the contractual structure.

2.77(i) The following table summarises the treatment for the determination of risk weights for *Mudārabah* contracts:

Contract	Applicable Stage of the Contract (When banking institutions start providing capital)	Determination of Risk Weight
Mudārabah for equity holding in banking book	Holding of equity	100% risk weight for publicly traded equity and 150% risk weight for non-publicly traded equity; or Supervisory slotting criteria method subject to fulfilling minimum requirements as per **Appendix VII**.
Mudārabah for project financing	Amount receivable from *Mudārib* in respect of progress payments due from ultimate customers	*If a binding agreement exists for ultimate customers to pay directly to banking institution:* Based on external rating of ultimate customer (Type of customer as per **Part B.2.2 Definition of Exposures**
	Remaining balance of funds advanced to the *Mudārib*.	150% risk weight[41]; or Supervisory slotting criteria method subject to fulfilling minimum requirements as per **Appendix VII**.

SUKŪK

2.78 *Sukūk* contracts are certificates that represent the holder's proportionate ownership in an undivided part of an underlying asset where the holder assumes all rights and obligations to such assets.

2.79 *Sukūk* contracts can be broadly categorised into:

- asset-based *sukūk*, such as in the case of *Salam, Istisnā`* and *Ijārah*; and
- equity-based *sukūk*, such as in the case of *Mushārakah* or *Mudārabah*.

[41] The Bank reserves the right to increase the risk weight if the risk profile of the exposure is deemed higher.

2.80 This part sets out the treatment for *Sukūk* held in the banking book. The treatment for Sukūk held in trading book is addressed in the market risk component of this framework.

2.81 The risk weight for *sukūk* that are rated by a recognised ECAI is determined based on the ECAI's external credit assessment as per **Part B.2.2 Definition of Exposures.** In the case of unrated *sukūk*, the risk weight is determined based on the underlying contract of the *sukūk*.

QARDH

2.81(i) *Qardh* is a loan given by a banking institution for a fixed period, where the borrower is contractually obliged to repay only the principal amount borrowed. In this contract, the borrower is not obligated to pay an extra amount (in addition to the principal amount borrowed) at his absolute discretion as a token of appreciation to the banking institution.

2.81(ii) Banking institutions are exposed to credit risk in the event that the borrower fails to repay the principal loan amount in accordance to the agreed repayment terms. Hence, the credit risk exposure commences upon the execution of the *Qardh* contract between the banking institution and the borrower.

2.82(iii) The risk weight for *Qardh* is determined based on the type of exposure as per **Part B.2.2 Definition of Exposures.**

B.2.4 OFF-BALANCE SHEET ITEMS

2.82 Off-balance sheet items shall be treated similarly to the Basel 1 framework, where the credit risk inherent in each off-balance sheet instrument is translated into an on-balance sheet exposure equivalent (credit equivalent) by multiplying the nominal principal amount with a credit conversion factor (CCF); and the resulting amount then being weighted according to the risk weight of the counterparty.

2.83 In addition, counterparty risk weights for over-the-counter (OTC) derivative transactions will be determined based on the external rating of the counterparty and will not be subject to any specific ceiling.

2.84 The CCFs for the various types of off-balance sheet instruments are as follows:

	Instrument	**CCF**
a.	Direct credit substitutes, such as general guarantees of indebtedness including standby letters of credit serving as financial guarantees for loans and securities), acceptances (including endorsements with the character of acceptances) and credit derivatives (if the banking institution is the protection seller).	100%
b.	Certain transaction-related contingent items, such as performance bonds, bid bonds, warranties and standby letters of credit related to particular transactions.	50%
c.	Short-term self-liquidating trade-related contingencies, such as documentary credits collateralised by the underlying shipments. The credit conversion factor shall be applied to both the issuing and confirming banks.	20%
d.	Assets[42] sold with recourse, where the credit risk remains with the selling institution.	100%
e.	Forward asset purchases, and partly-paid shares and securities, which represent commitments with certain drawdown.	100%
f.	Obligations under an on-going underwriting	50%

[42] Item (d), which includes housing loans sold to Cagamas Bhd, and (e), should be risk-weighted according to the type of asset (housing loan) and not according to the counterparty (i.e. Cagamas) with whom the transaction has been entered into.

	Instrument	CCF
	agreement (including underwriting of shares/ securities issue) and revolving underwriting facilities.	
g.	Lending of banking institutions' securities or the posting of securities as collateral by banking institutions, including instances where these arise out of repo-style transactions. (i.e. repurchase / reverse repurchase and securities lending / borrowing transactions.	100%
h.	Derivatives contracts.	Credit equivalent to be derived using current exposure method[43] as given in **Appendix VIII.**
i.	Other commitments, such as formal standby facilities and credit lines, with an original maturity of over one year.	50%
j.	Other commitments, such as formal standby facilities and credit lines, with an original maturity of up to one year.	20%
k.	Any commitments that are unconditionally cancelled at any time by the banking institution without prior notice or that effectively provide for automatic cancellation due to deterioration in a borrower's creditworthiness.	0% Refer to paragraph 2.84(i)
l.	Unutilised credit cards lines.	20%

2.84 (i) Any commitments that are unconditionally and immediately cancellable and revocable by the banking institution or that effectively provide for automatic cancellation due to deterioration in a borrower's creditworthiness (for example, corporate overdrafts and other facilities), at any time without prior notice, will be subject to 0% CCF. To utilise the 0% CCF, the banking institution must demonstrate that legally, it has the ability to cancel these facilities and that its internal control systems and monitoring practices are adequate to support timely cancellations which the banking institution does effect in practice upon evidence of a deterioration in a borrower's creditworthiness. Banking institutions should also be able to demonstrate that such cancellations have not exposed the

[43] The credit equivalent exposure is based on the sum of the positive mark-to-market replacement cost of the contract and the potential future exposure.

banking institution to legal actions, or where such actions have been taken, the courts have decided in favour of the banking institution.

2.85 Where there is an undertaking to provide a commitment on an off-balance sheet item[44], banking institutions can apply the lower of the two applicable credit conversion factors.

2.86 In addition to the computation under item (h) above, counterparty credit risk may also arise from unsettled securities, commodities, and foreign exchange transactions from the trade date, irrespective of the booking or accounting transaction. Banking institutions are encouraged to develop, implement and improve systems for tracking and monitoring the credit risk exposures arising from unsettled transactions as appropriate for producing management information that facilitates action on a timely basis. When these transactions are not processed via a delivery-versus-payment system (DvP) or a payment-versus-payment (PvP) mechanism, these transactions are subject to a capital charge as calculated in **Appendix IX.**

2.87 Banking institutions must also closely monitor securities, commodities, and foreign exchange transactions that have failed, starting from the first day they fail. The capital treatment for these failed transactions is also calculated based on **Appendix IX**.

B.2.5 CREDIT RISK MITIGATION

2.88 This section outlines general requirements for the use of credit risk mitigation and eligibility criteria, detailed methodologies and specific requirements with respect to the following CRM techniques:

i) Collateralised transactions;
ii) On-balance sheet netting; and
iii) Guarantee and credit derivatives.

[44] Such as commitments to provide letters of credit or guarantees for trade purposes. For example, if a banking institution provides the customer a committed limit on the amount of letters of credit they can issue over a one-year period, with the customer drawing on this committed limit over time.

2.89 No additional CRM will be recognised for capital adequacy purposes on exposures where the risk weight is mapped from a rating specific to a debt security where that rating already reflects CRM. For example, if the rating has already taken into account a guarantee pledged by the parent of the borrower, then the guarantee shall not be considered again for credit risk mitigation purposes.

2.90 While the use of CRM techniques reduces or transfers credit risk, it may introduce or increase other risks such as legal, operational, liquidity and market risk. Therefore, it is imperative that banking institutions control these risks by employing robust policies, procedures and processes including strategies to manage these risks, valuation, systems, monitoring and internal controls. Banking institutions must be able to demonstrate to the Bank that it has adequate risk management policies and procedures in place to control these risks arising from the use of CRM techniques. In any case, the Bank reserves the right to take supervisory action under Pillar 2 should the banking institution's risk management in relation to the application of CRM techniques be insufficient. In addition, banking institutions will also be expected to observe Pillar 3 requirements[45] in order to obtain capital relief in respect of any CRM techniques.

Minimum Conditions for the Recognition of Credit Risk Mitigation Techniques

2.91 In order to obtain capital relief for use of any CRM technique, the following minimum conditions must be fulfilled:

i) 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;

ii) sufficient assurance from legal counsel has been obtained with respect to the legal enforceability of the documentation; and

[45] Please refer to Guidelines on Risk-Weighted Capital Adequacy Framework (Basel II) – Disclosure Requirements (Pillar 3)

iii) periodic review is undertaken to confirm the ongoing enforceability of the documentation.

2.92 In addition to the above, for banking institutions operating with an Islamic banking operations, where the CRM technique is applied on Islamic banking exposures to obtain capital relief, the collateral used in the CRM computation must be fully *Sharī`ah*-compliant.

2.93 In general, only collateral and/or guarantees that are actually posted and/or provided under a legally enforceable agreement are eligible for CRM purposes. A commitment to provide collateral or a guarantee is not recognised as an eligible CRM technique for capital adequacy purposes until the commitment to do so is actually fulfilled.

Credit Risk Mitigation Techniques

Collateralised Transactions

2.94 A collateralised transaction is one in which:

i) banking institutions have a credit exposure or potential credit exposure; and

ii) 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.

2.95 For collateralised transactions, banking institutions may opt for either the **simple approach** (paragraphs 2.107 to 2.114), which, similar to the Basel I framework, substitutes the risk weight of the collateral for the risk weight of the counterparty for the collateralised portion of the exposure, or the **comprehensive approach** (from paragraph 2.115 to 2.137), which allows greater offset of collateral against exposures, by effectively reducing the exposure amount by the value ascribed to the collateral.

2.96 The comprehensive approach for the treatment of collateral will also be applied to calculate counterparty risk charges for over-the-counter (OTC) derivatives and repo-style transactions in the trading book.

2.97 Banking institutions shall adopt any of the two approaches for exposures in the banking book and this approach must be applied consistently within the banking book. (This rule however, does not apply to Islamic banking exposure, whereby the banking institutions are allowed to use simple approach for recognition of non-physical asset collateral and the comprehensive approach for physical asset collateral concurrently). For the trading book, only the comprehensive approach is allowed. 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.

2.98 Banking institutions shall indicate upfront to the Bank which approach it intends to adopt for CRM purposes. Any subsequent migration to a different approach shall also be communicated to the Bank.

Minimum Requirements for Collateralised Transactions

2.99 In addition to the general requirements specified under paragraphs 2.91 to 2.93, 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 the collateral in a timely manner in the event of default, insolvency or bankruptcy of the counterparty. Furthermore, banking institutions must take all steps necessary to fulfill those requirements under the law to protect their interest in the collateral.

2.100 For collateral to provide effective cover, the credit quality of the counterparty and the value of collateral must not have a material positive correlation. For example, securities issued by the counterparty or a related

counterparty[46] as a form of collateral against a loan would generally be materially correlated, thus providing little cover and therefore would not be recognised as eligible collateral.

2.101 Banking institutions must have clear and robust procedures for 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.

2.102 A capital requirement will be applied on either side of a collateralised transaction. For example, both repurchase and reverse repurchase agreements will be subject to capital requirements. Likewise, both sides of securities lending and borrowing transactions will be subject to explicit capital charges, as will the posting of securities in connection with a derivative exposure or other borrowing. However, sale and buyback agreement (SBBA) and reverse SBBA transactions will not be deemed as collateralised transactions given that they involve outright purchase and sale transactions. Please refer to **Appendix XIX** for the capital treatment for these transactions.

2.103 Where banking institutions are 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 its obligations, then the risk to the banking institution is the same as if the banking institution had entered into the transaction as a principal. In such circumstances, a banking institution will be required to allocate capital requirement as if it were itself the principal.

2.104 Where collateral is held by a custodian, banking institutions must take reasonable steps to ensure good custody of that collateral and take

[46] As defined under *Single Counterparty Exposure Limit*.

reasonable steps to ensure that the custodian segregates the collateral from its own assets.

Eligible Collateral

2.105 In the computation of capital adequacy requirements for collateralised transactions, the following collateral instruments are eligible for recognition under the simple and comprehensive approach subject to the minimum conditions specified above being met:

Approach	Collateral Recognised
Simple Approach	▪ Cash[47] (including certificate of deposits or comparable instruments issued by the lending banking institution) on deposit[48] with the bank which is incurring the counterparty exposure[49] ▪ Gold ▪ Debt securities/*Sukūk* rated by ECAIs where the risk weight attached to the debt securities is lower than that of the borrower ▪ Debt securities/*Sukūk* unrated by a recognised ECAI but fulfil the following conditions: – Issued by a banking institution; – Listed on recognised exchange; – Classified as senior debt; – All rated issue of the same seniority by the issuing bank that are rated at least BBB- or A-3/P-3 or any equivalent rating; and – The Bank is sufficiently confident about the market liquidity of the debt security/*sukūk*. ▪ Equities (including convertible bonds/sukūk) that are included in the main index (refer to **Appendix X**) ▪ Funds (e.g. collective investment schemes, unit trust funds, mutual funds etc.) where – A price for the units is publicly quoted daily, and – The unit trust funds/mutual fund is limited to investing in the financial instruments listed in this table. (The use or potential use by a fund of derivative instruments solely to hedge investments listed in this table shall not prevent units in that fund from being an eligible financial collateral.)
Comprehensive Approach	▪ All of the above, and: ▪ Equities (including convertible bonds/sukūk) which are not included in a main index i.e. Composite Index of Bursa Malaysia but which

47 Cash pledged includes `*urbūn* (or earnest money held after a contract is established as collateral to guarantee contract performance) and *hamish jiddiyyah* (or security deposit held as collateral) in Islamic banking contracts (for example, *Ijārah*)

48 Structured deposits and Restricted Investment Accounts would not qualify as eligible financial collateral.

49 Cash funded credit linked notes issued by the banking instituion against exposures in the banking book which fulfil the criteria for credit derivatives will be treated as cash collateralised transactions.

Approach	Collateral Recognised
	are listed on a recognised exchange (refer to **Appendix X**) ▪ Funds (e.g. collective investment schemes, unit trust funds, mutual funds etc.) which include equities that are not included in a main index i.e. Composite Index of Bursa Malaysia but which are listed on a recognised exchange. (refer to **Appendix X**)

2.106 Under certain Islamic banking transactions such as *Murābahah, Salam, Istisna'* and *Ijārah*, underlying physical assets, namely commercial and residential real estate[50] as well as plant and machinery are recognised as collateral or risk mitigant. These physical assets could be recognised as eligible collateral subject to fulfilling the minimum requirements specified under the comprehensive approach as well as additional criteria specified in **Appendix XI**.

Simple Approach

2.107 Under this approach, where an exposure on a counterparty is secured against eligible collateral, the secured portion of the exposure must be weighted according to the risk weight appropriate to the collateral. The unsecured portion of the exposure must be weighted according to the risk weight applicable to the original counterparty.

2.108 For collateral used under the simple approach, the collateral must be pledged for at least the entire life of the exposure, it must be marked-to-market and re-valued at a minimum frequency of **6 months.** The portion of exposure collateralised by the market value of the recognised collateral will 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 2.110 to 2.112. The

[50] Exposures that fulfil the criteria of loans secured by residential properties and hence, are entitled to receive the qualifying residential mortgage risk weight are not allowed to use the underlying residential real estate as a credit risk mitigant. This also applies to exposures which do not meet the criteria for loans secured by residential properties but meet the criteria for exposures classified under the regulatory retail portfolio. In addition, banking institutions do not have the option to classify exposures secured by residential properties or the regulatory retail portfolio as exposures to corporate specifically to enjoy the benefits of credit risk mitigation.

remainder of the exposure shall be assigned the original risk weight accorded to the counterparty.

2.109 In determining the appropriate risk weight to be assigned on collateral pledged by the counterparty, banking institutions should refer to risk weight tables specified under **Appendix III.** For collateral denominated in local currency, banking institutions must use the risk weight linked to domestic currency ratings. Similarly, the risk weight linked to foreign currency ratings should be used if collateral pledged is denominated in foreign currency.

Exceptions to the Risk Weight Floor

2.110 Transactions which fulfill the criteria outlined in paragraph 2.125 and are done with a core market participant, as defined in paragraph 2.127, will receive a risk weight of 0%. If the counterparty to the transaction is not a core market participant but fulfill all condition on paragraph 2.130, the transaction should receive a risk weight of 10%.

2.111 A 0% risk weight can also be applied where the exposure and the collateral are denominated in the same currency, and either:

- the collateral is cash on deposit as defined in paragraph 2.105; or
- the collateral is in the form of securities eligible for a 0% risk weight, and its market value has been discounted by 20%.

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

Collateralised OTC Derivatives Transactions[51]

2.113 As specified in **Appendix VIII**, the calculation of the counterparty credit risk charge for an individual contract will be as follows:

Counterparty Charge = [(RC + add-on) – CA] x r x 8%

Where:

RC = the replacement cost
add-on = the amount for potential future exposure calculated according to **Appendix VIII.**
CA = the volatility adjusted collateral amount under the comprehensive approach
R = the risk weight of the counterparty

2.114 When effective bilateral netting contracts are in place, RC will be the net replacement cost and the add-on will be A_{Net}[52] as calculated according to **Appendix VIII**. The haircut for currency risk (H_{fx}) should be applied when there is a mismatch between the collateral currency and the settlement currency. Even in the case where there are more than two currencies involved in the exposure, collateral and settlement currency, a single haircut assuming a 10-business day holding period scaled up as necessary depending on the frequency of mark-to-market will be applied.

Comprehensive Approach

2.115 Under the comprehensive approach, when taking collateral, banking institutions must calculate an adjusted exposure amount to a counterparty after risk mitigation, E*. This is done by applying volatility adjustments to both the collateral and the exposure[53] , taking into account possible future price fluctuations. Unless either side of the transaction is cash, the volatility adjusted amount for the exposure shall be higher than the actual exposure and lower than the collateral.

51 For example, collateralised interest rate swap transactions.
52 Add-on for netted transactions.
53 Exposure amounts may vary where, for example, securities are being lent.

2.116 The adjusted exposure amount after risk mitigation shall be weighted according to the risk weight of the counterparty to obtain the risk-weighted asset amount for the collateralised transaction.

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

Calculation of Capital Requirement

2.118 Under the comprehensive approach, the adjusted exposure amount after risk mitigation for collateralised transactions is calculated as follows:

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

where:

E* = The exposure value after risk mitigation
E = Current value of the exposure
H_E = Haircut appropriate to the exposure
C = The current value of the collateral received
H_C = Haircut appropriate to the collateral
H_{FX} = Haircut for currency mismatch between the collateral and exposure

Standard Supervisory Haircuts

2.119 For purposes of applying the comprehensive approach for collateralised transactions, the standard supervisory haircuts[54] (H), expressed as percentage, are as follows:

Issue Rating for Debt Securities/*Sukūk*	Residual Maturity	Sovereign	Other Issues
AAA to AA-/A-1	≤ 1 year	0.5	1
	> 1 year, ≤ years 5	2	4
	> 5 years	4	8
A+ to BBB-/A-2 to A-3/P-3 and unrated bank securities/*sukūk*	≤ 1 year	1	2
	> 1 year, ≤ years 5	3	6
	>5 years	6	12
BB+ to BB-	All	15	
Main index equities (including convertible bonds/*sukūk*) and Gold		15	
Other equities (including convertible bonds/*sukūk*) listed on a recognised exchange		25	

[54] Assuming daily mark-to-market, daily remargining and 10-business day holding period, except for physical assets that are subjected to minimum annual revaluation as per **Appendix XI.**

Issue Rating for Debt Securities/*Sukūk*	Residual Maturity	Sovereign	Other Issues
Funds (e.g. collective investment schemes, unit trust funds, mutual funds)		Highest haircut applicable to any security in which the fund can invest at any one time.	
Cash in the same currency		0	
CRE/RRE/Other physical collaterals (only available as credit risk mitigants for Islamic banking exposures)[55]		30	
Currency mismatch		8	

2.120 For transactions in which a banking institution lends non-eligible instruments (e.g. non-investment grade corporate debt securities/*sukūk*), the haircut to be applied on the exposure should be the same as that for other equities, i.e. 25%

Adjustment to standard supervisory haircuts for different holding periods and non-daily mark-to-market or re-margining

2.121 For some transactions, depending on the nature and frequency of revaluation and re-margining provisions, different holding periods are appropriate. In this regard, the framework for collateral haircuts distinguishes between repo-style transactions (repurchase/reverse repurchase agreement and securities lending/borrowing), other capital market transactions (OTC derivatives transaction and margin lending) and secured lending.

2.122 The minimum holding period for the various products is summarised in the following table:

Transaction Type	Minimum Holding Period	Condition
Repo-style transaction	Five business days	Daily re-margining
Other capital market transaction	Ten business days	Daily re-margining
Secured lending	Twenty business days	Daily revaluation

[55] While the Bank has provided a minimum 30% haircut on other types of physical collateral, banking institutions should exercise conservatism in applying haircuts on physical assets' value used as CRM for capital requirement purposes. In this regard, banking institutions are expected to use a more stringent haircut should their internal historical data on the disposal of physical assets reveal loss amounts which reflect a haircut of higher than 30%. Please refer to **Appendix XIX** for additional requirements for recognition of other physical collateral.

2.123 When the frequency of re-margining or revaluation is longer than the minimum, the minimum haircut numbers will be scaled up depending on the actual number of business days between re-margining or on the 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 re-margining for capital market transactions or revaluations for secured transactions

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

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

Where:

T_N = Holding period used by the banking institution for deriving H_N

H_N = Haircut based on the holding period T_N

2.124 For banking institutions using the standard supervisory haircuts, the 10-business day haircuts provided in paragraph 2.119 will be the basis and this haircut will be scaled up or down depending on the type of transactions and the frequency of re-margining 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 re-margining for capital market transactions or revaluation for secured transactions

T_M = Minimum holding period for the type of transaction

Conditions for Zero Haircut

2.125 For repo-style transactions, a banking institution may apply a zero haircut instead of the supervisory haircuts specified under the comprehensive approach for CRM purposes where the following conditions are satisfied and the counterparty is a **core market participant.**

- Both the exposure and the collateral are cash or a sovereign security qualifying for a 0% risk weight in the standardised approach;
- Both the exposure and collateral are denominated in the same currency;
- Either the transaction is overnight or both the exposure and the collateral are marked-to-market daily and are subject to daily re-margining;
- Following a counterparty's failure to re-margin, the time that is required between the last mark-to-market before the failure to re-margin and the liquidation of the collateral is considered to be no more than four business days;
- The transaction is settled across a settlement system proven for that type of transaction;
- The documentation covering the agreement is standard market documentation for repurchase/reverse repurchase agreements and securities/lending borrowing transactions in the securities concerned;
- 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
- Upon any default event, regardless of whether the counterparty is insolvent or bankrupt, the banking institution has the unfettered, legally enforceable right to immediately seize and liquidate the collateral for its benefit.

2.126 However, this carve-out will not be made available for banking institutions using the VaR modelling approach as described in paragraphs 2.133 to 2.137.

2.127 For the purpose of applying the zero haircut, the following entities are considered core market participants:

i) The Federal Government of Malaysia;
ii) Bank Negara Malaysia; and
iii) Licensed banking institutions and Islamic banking institutions in Malaysia.

2.128 Where other national supervisors have accorded a similar treatment to core market participants of their jurisdictions, banking institutions can also apply a similar treatment to these exposures. However, the Bank reserves the right to review the treatment for these transactions if the treatment is deemed to be inappropriate.

Treatment of repo-style transactions covered under master netting agreement

2.129 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 in each relevant jurisdiction upon the occurrence of an event of default and regardless of whether the counterparty is insolvent or bankrupt. In addition, the netting agreement must:

i) provide the non-defaulting party the right to terminate and close-out in a timely manner all transactions under the agreement upon event of default, including in the event of insolvency or bankruptcy of the counterparty;
ii) provide for the netting of gains and losses in transactions (including the value of any collateral) terminated and closed out under it so that single net amount is owed by one party to the other;
iii) allow for the prompt liquidation or setoff of collateral upon the event of default; and

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

2.130 In addition, all repo-style transactions should be subjected to the Global Master Repurchase Agreement (GMRA) with its relevant annexes that specify all terms of the transaction, duties and obligations between the parties concerned. Banking institutions must also ensure that other requirements specified under the Bank's current guidelines on repo-style transactions have also been met.

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

i) all transaction are marked to market daily; and

ii) the collateral instruments used in the transactions are recognised as eligible financial collateral in the banking book.

2.132 The following formula will be applied to take into account the impact of master netting agreements:

$$E^* = \max\left\{0, \left[\left(\sum E - \sum C\right) + \sum\left(E_S \times H_S\right) + \sum\left(E_{FX} \times H_{FX}\right)\right]\right\}$$ [56]

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 given security

H_S = Haircut appropriate to Es

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

H_{FX} = Haircut appropriate for currency mismatch

[56] The starting point for this formula is the formula in paragraph 2.118 which can also be presented as the following: E* = max {0, [(E -C) + (E x He) + (C x Hc) + (C x Hfx)]}.

Use of VaR Models

2.133 As an alternative to the use of standard supervisory haircuts for eligible collateral under the comprehensive approach, banking institutions also may be allowed to use a VaR models approach to reflect the price volatility of the exposure and collateral for repo-style transactions, taking into account correlation effects between security positions. This approach would apply to repo-style transactions covered by bilateral netting agreements on a counterparty-by-counterparty basis as well as other similar transactions (like prime brokerage), that meet the requirements for repo-style transactions.

2.134 The VaR models approach is available to banking institutions that have received the Bank's approval to use internal market risk models for purposes of calculating the market risk component of this framework. Banking institutions which have yet to receive approval to use the internal market risk models can separately apply to use internal VaR models for calculating price volatility for repo-style transactions. These internal models will only be accepted when a banking institution can prove to the Bank the quality of the model through the backtesting of its output using one year of historical data.

2.135 In this regard, the Bank would expect that static, historical backtesting on representative counterparty portfolios be part of the model validation process. In addition, these representative portfolios must be chosen based on their sensitivity to the material risk factors and correlations to which the banking institution is exposed.

2.136 The quantitative and qualitative criteria for the recognition of internal market risk models for repo-style transactions and other similar transactions are in principle the same as under the market risk component of this framework. With regard to the holding period, the minimum will be 5-business days, rather than the 10-business days under market risk component of this framework. For other transactions eligible for the VaR

models approach, the 10-business days holding period will be retained. The minimum holding period should be adjusted upwards for market instruments where such holding period would be inappropriate given the liquidity of the instrument concerned.

2.137 The calculations of the exposure E* for banking institutions using their internal market risk model will be the following:

$$E^* = \max\{0, [(\sum E - \sum C) + VaR]\}$$

Where

E* = The exposure value after risk mitigation

E = Current value of the exposure

C = The value of the collateral received

VaR = VaR output from internal market risk model

On-Balance Sheet Netting

2.138 Banking institutions are allowed to compute credit exposures on a net basis for capital requirements where banking institutions have legally enforceable netting arrangements for loans and deposits[57].

2.139 In addition, banking institution can only apply on-balance sheet netting on any exposure if the following conditions have be met:

strong legal basis that the netting or off-setting agreement is enforceable in each relevant jurisdiction regardless of whether the counterparty is in default, insolvent or bankrupt,

- able to determine at any time all assets and liabilities with the same counterparty that are subject to netting agreement,
- monitors and controls roll-off risks[58], and
- monitors and controls the relevant exposure on a net basis.

[57] Structured deposits and Restricted Investment Account would not be recognised for on-balance sheet netting.

[58] Roll-off risks relate to the sudden increases in exposure which can happen when short dated obligations (for example deposits) used to net long dated claims (for example loans) mature.

2.140 The computation of net exposure to a particular counterparty for capital adequacy computation purposes is similar to that specified for collateralised transactions under paragraph 2.118, where assets (loans) will be treated as exposures and liabilities (deposits) as collateral. For on-balance sheet netting, the haircut will be zero except where there is a currency mismatch. A 10-business day holding period will apply when daily mark-to-market is conducted and all the requirements contained in paragraphs 2.119, 2.124, and 2.155 to 2.158 will apply.

2.141 The net exposure amount will be multiplied by the risk weight of the counterparty to obtain risk-weighted assets for the exposure following the on-balance sheet netting.

Guarantees and Credit Derivatives

2.142 For a guarantee or credit derivative to be eligible for CRM, the following conditions must be met:

i) the guarantee or credit derivative 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 cannot be disputed;

ii) the credit protection contract must be irrevocable except where the credit protection purchaser has not made the payment due to their protection provider. The protection provider must also not have the right to unilaterally cancel the credit cover or increase the effective cost of cover as a result of deteriorating credit quality in the hedged exposure; and

iii) The contract must not have any clause or provision outside the direct control of the banking institution that prevents the protection provider from being obliged to pay in a timely manner in the event that the original counterparty fails to make the payment(s) due.

Additional operational requirements specific for guarantees and credit derivatives as specified in paragraphs 2.144 and 2.145 respectively must be met.

2.143 The substitution approach will be applied in determining capital relief for exposures protected by guarantees or credit derivatives. Where an exposure on a counterparty is secured by a guarantee from an eligible guarantor, the portion of the exposure that is supported by the guarantee is to be weighted according to the risk weight appropriate to the guarantor (unless the risk weight appropriate to the original counterparty is lower). The unsecured portion of the exposure must be weighted according to the risk weight applicable to the original obligor.

Additional Operational Requirements for Guarantees

2.144 In addition to the requirements on legal certainty of the guarantee specified in paragraphs 2.91 to 2.93, all the following conditions must also be satisfied:

i) On the default/non-payment of the counterparty, the banking institution may in a timely manner pursue the guarantor for any monies outstanding under the documentation governing the transaction. The guarantor may pay at once all monies under such documentation to the banking institution, or the guarantor may assume the future payment obligations of the counterparty covered by the guarantee;

ii) The guarantee undertaking is explicitly documented; and

iii) Except as noted in the following sentence, the guarantee covers all types of payments the borrower is expected to make under the documentation governing the transaction, such as notional amount, margin payments etc. Where a guarantee covers payment of principal only, interests and other uncovered payments should be treated as unsecured amounts in line with the treatment for proportionally covered exposures under paragraph 2.151.

2.144 (i) For a banking institution to recognise trade credit insurance or trade credit takaful as CRM, the banking institution must:

i) be both the policy owner or takaful participant and the person covered, as the case may be;

ii) not be the assignee, or assign the benefits of the policy or takaful certificate to another party;

iii) establish, at minimum, the following policies and procedures:

- a process to determine and verify the completeness and appropriateness of documentation, and information required for submission to the licensed insurer or licensed takaful operator;
- a mechanism to monitor specified deadlines and credit standing of obligors (i.e. the buyer of trade goods); and
- a process for timely and regular communication between the banking institution and the licensed insurer or licensed takaful operator; and

iv) obtain a legal opinion[59] confirming that the policy or takaful certificate is unconditional[60] and irrevocable[61] as required for CRM recognition under this policy document.

Additional Operational Requirement for Credit Derivatives

2.145 For a credit derivative contract to be recognised, the following conditions must be satisfied:

i) Credit events specified by the contracting parties must at least cover:

- Failure to pay the amounts due under terms of the underlying obligation at the time of such failure;

[59] Banking institutions may rely on in-house legal expertise or obtain opinion from an external legal firm.

[60] The conditions for a policy or takaful certificate to qualify as "unconditional" are stipulated in paragraph 2.142 iii). Exclusionary clauses relating to fraudulent, criminal acts, and insolvency of banks and losses caused by nuclear or harmful substance contamination and war between major countries would not cause the trade credit insurance or trade credit takaful to be deemed as conditional.

[61] The conditions for a policy or takaful certificate to qualify as "irrevocable" are stipulated in paragraph 2.142 ii).

- Bankruptcy, insolvency and inability of the borrower to pay its debts, or its failure or admission in writing of its inability generally to pay its debt as they become due, and analogous events; and
- Restructuring of the underlying obligation involving forgiveness or postponement of principal, interest or fees that results in a credit loss event (i.e. charge off, provision or other similar debt to the profit and loss account). However, when restructuring is not specified as a credit event but the other requirements in this paragraph are met, partial recognition of the credit derivatives will be allowed, as follows:
  - If the amount of credit derivatives is less than or equal to the amount of underlying obligation, 60% of the amount of the hedge can be recognised as covered.
  - If the amount of the credit derivative is larger than that of the underlying obligation, then the amount of eligible hedge is capped at 60% of the amount of the underlying obligation.

ii) The credit derivatives shall not terminate prior to expiration of any grace period required for a default on the underlying obligation to occur as a result of a failure to pay, subject to the provision of paragraph 2.156;

iii) Credit derivatives allowing for cash settlement are recognised for capital purpose insofar as a robust valuation process is in place in order to estimate loss reliably. There must be a clearly specified period for obtaining post-credit-event valuation of the underlying obligation;

iv) If the contract requires the protection purchaser to transfer the underlying obligation to the protection provider at settlement, the terms of the underlying obligation must provide that consent to such transfer should not be unreasonably withheld;

v) The identity of the parties responsible for determining whether a credit event has occurred must be clearly defined. This determination must not be the sole responsibility of the protection seller. The protection

buyer must have the right/ability to inform the protection provider of the occurrence of a credit event;

vi) A mismatch between the underlying obligation and the obligation used for purposes of determining whether a credit event has occurred is permissible if

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

vii) If the credit derivatives cover obligations that do not include the underlying obligation, a mismatch between the underlying and the reference obligation for the credit derivative (i.e. the obligation used for purposes of determining cash settlement value of the deliverable obligation) is permissible if

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

2.146 For credit derivatives, only credit default swaps and total return swaps that provide credit protection equivalent to guarantees will be eligible for recognition. No recognition is given where banking institutions buy credit protection through a total return swap and record the net payments received on the swap as net income, but does not record offsetting deterioration in the value of the asset that is protected (either through reductions in fair value or by an addition to reserve).

2.147 Banking institutions also have to demonstrate to the supervisors that any additional minimum requirements of risk management practices outlined in the Bank's current guidelines are met[62].

Range of Eligible Guarantors/Credit Protection Providers

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

i) sovereign entities[63], PSEs, banks and securities firms with a lower risk weight than the counterparty; and

ii) other entities rated BBB- or better. This would include credit protection provided by parent, subsidiary and affiliate companies when they have a lower risk weight than the obligor.

2.148(i) Banking institutions shall only recognise trade credit insurance or trade credit takaful as CRM if obtained from a licensed insurer, licensed takaful operator[64] or prescribed development financial institution with a minimum rating of BBB-.

2.148(ii) For trade credit insurance or trade credit takaful ceded to a reinsurer or retakaful operator, banking institutions shall only recognise these as CRM if the reinsurer or retakaful operator is rated at least BBB-, and the reinsurance or retakaful contract–

i) fulfils the requirements of a guarantee in this policy document;

ii) provides an equally robust level of protection[65] as the trade credit policy or takaful certificate between the banking institution and the licensed insurer, licensed takaful operator or prescribed development financial institution; and

---

62 [Deleted]

63 This includes the Bank for International Settlement, the International Monetary Fund, the European Central Bank and the European Community, as well as those MDBs referred to in footnote 13.

64 Refers to licensed insurers under FSA or licensed takaful operators under IFSA.

65 To the extent possible, similar terms as per the trade credit insurance policy or takaful certificate between the banking institution and the licensed insurer, licensed takaful operator or a prescribed development financial institution must be included. For example, the reinsurance contract must give similar effect to the risks covered, exclusions and claims payment timeline as the insurance policy/takaful certificate.

iii) includes a specific clause in the legal documentation that enables the banking institution to pursue claim payments directly from the reinsurer or retakaful operator when there is a default in payment of claims by the licensed insurer, licensed takaful operator or prescribed development financial institution.

Risk Weights

2.149 The protected portion is assigned the risk weight of the protection provider. The uncovered portion of the exposure is assigned the risk weight associated with the borrower.

2.150 Any amount for which the banking institution will not be compensated for in the event of loss shall be recognised as first loss positions and risk-weighted at 1250% by the banking institution purchasing the credit protection.

Proportional and Tranched Cover

2.151 Where partial coverage exists, or where there is a currency mismatch between the underlying obligation and the credit protection, the exposure must be split into covered and uncovered amount. The treatment is outlined below:

Proportional Cover

- Where the amount guaranteed, or against which credit protection is held, is less than the amount of the exposure, and the secured and unsecured portions are equal in seniority, i.e. the banking institution and guarantor share losses on a pro-rata basis, capital relief will be accorded on a proportional basis with the remainder being treated as unsecured.

Tranched Cover

- Where:

- a banking institution transfers a portion of the risk of an exposure in one or more tranches to a protection seller(s) and retains some level of risk of the exposure; and
- the portion of risk transferred and retained are of different seniority,

the banking institution may obtain credit protection for either the senior tranche (e.g. second loss portion) or the junior tranche (e.g. first loss portion). In this case, the rules as set out in the securitisation component of this framework will apply.

Currency Mismatches

2.152 Where the credit protection is denominated in a currency different from that in which the exposure is denominated, a haircut, $H_{FX,}$ shall be applied on the exposure protected, as follows

$$GA = G \times (1 - H_{FX})$$

where:

G = Nominal amount of the credit protection

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

2.153 The supervisory haircut will be 8%. The haircut 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 2.123.

Sovereign Guarantees and Counter-Guarantees

2.154 As specified in paragraph 2.16, a lower risk weight may be applied to banking institution's exposures to sovereign or central bank, where the banking institution is incorporated and where the exposure is denominated in domestic currency and funded in that currency. This treatment is also extended to portions of exposures guaranteed by the sovereign or central bank, where the guarantee is denominated in the domestic currency and the exposure is funded in that currency. An exposure may be covered by a guarantee that is indirectly counter-guaranteed by a sovereign. Such an

exposure may be treated as covered by a sovereign guarantee provided that:

- the sovereign counter-guarantee covers all credit risk elements of the exposure;
- both the original guarantee and the counter-guarantee meet all operational requirements for guarantees, except that the counter-guarantee need not be direct and explicit to the original exposure; and
- The 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

2.155 For calculating RWA, a maturity mismatch occurs when the residual maturity of a hedge is less than that of the underlying exposure.

(i) Definition of Maturity

2.156 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 fulfil 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 banking institution but the terms of the arrangement at origination of the hedge contain a positive incentive for the banking institution to call the transaction before contractual maturity, the remaining time to the first call date will be deemed to be the effective maturity. For example, where there is a step-up in cost in conjunction with a call feature or where the effective cost of cover increases over time even if credit quality remains the same or increases, the effective maturity will be the remaining time to the first call.

(ii) Risk weights for Maturity Mismatches

2.157 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 exposure with original maturities of less than one year must be matched to be recognised. In all cases, hedges with maturity mismatches will no longer be recognised when the have a residual maturity of the three months or less.

2.158 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:

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

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

Other Aspects of Credit Risk Mitigation

Treatment of Pools of Credit Risk Mitigation Techniques

2.159 When multiple credit risk mitigation techniques are used to cover a single exposure, the exposure should be divided into portions which are covered by each type of credit risk mitigation technique. The risk-weighted assets of each portion must be calculated separately. Where credit protection provided by a single guarantor has different maturities, these must also be divided into separate portions.

2.160 In addition, where a single transaction is attached to multiple forms of credit risk mitigants, banking institutions are able to obtain the largest capital relief possible from the risk mitigants.

First to Default Credit Derivatives

2.161 There are cases where a banking institution obtains protection for a basket of reference names and where the first default among the reference names triggers the credit protection and the credit event also terminates the contract. In this case, the banking institution may recognise regulatory capital relief for the asset within the basket with the lowest risk-weighted amount, but only if the notional amount is less than or equal to the notional amount of the credit derivative.

2.162 The following is an example of the computation based on a basket of three assets:

Asset	Amount	Risk Weight	Risk-weighted Exposure
A	RM 100	100%	RM100
B	RM 100	100%	RM100
C	RM 100	50%	RM 50
Total			**RM250**

Asset C has the lowest risk-weighted exposure and therefore is protected. Assuming the risk weight of the protection seller is 20%, the risk-weighted exposure after credit risk mitigation is RM100 (for Asset A) + RM100 (for Asset B) + RM20 (for Asset C) (being RM100 X 20%) giving a total of **RM220**.

2.163 With regard to the banking institution providing credit protection through such an instrument, if the product has an external credit assessment from an eligible ECAI, the risk weight as specified under the Securitisation Framework[66] will be applied. If the product is not rated by an eligible external credit assessment institution, the risk weights of the assets included in the basket will be aggregated up to a maximum of 1250% and

[66] Refer to **Part F**.

multiplied by the nominal amount of the protection provided by the credit derivative to obtain the risk-weighted asset amount.

Second to Default Credit Derivatives

2.164 In the case where the second to default among the assets within the basket triggers the credit protection, the banking institution obtaining credit protection through such a product will only be able to recognise any capital relief if first default protection has also been obtained or when one of the assets within the basket has already defaulted.

2.165 For banking institutions providing credit protection through such a product, the capital treatment is the same as in paragraph 2.161 above with one exception. The exception is that, in aggregating the risk weights, the asset with the lowest risk-weighted amount can be excluded from the calculation.

Floor for Exposures Collateralised by Physical Assets

2.166 For banking institutions with Islamic banking operations, the RWA for exposures collateralised by physical assets shall be the higher of:

i) RWA calculated using the CRM method; or

ii) 50% risk weight applied on the gross exposure amount (i.e. before any CRM effects).

B.3 THE INTERNAL RATINGS BASED APPROACH

B.3.1 ADOPTION OF THE IRB APPROACH

Adoption of IRB Across Asset Classes

3.1 Once a banking institution within a banking group adopts the IRB approach, the entire banking group would be expected to adopt a similar approach, except for those permanently exempted asset classes in paragraph 3.4. This is to avoid cherry-picking of assets to be put under the IRB approach. A phased rollout of the IRB approach across the banking group is allowed based on the following:

i) Adoption of IRB approach across individual asset class[67]/sub-classes[68] within the same business unit;

ii) Adoption of IRB approach across business units in the same banking group; and

iii) Move from the foundation IRB approach to advanced IRB approach for certain risk components.

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

3.2 Banking institutions should produce an implementation plan, specifying the intended roll out of the IRB approaches across significant asset classes (or sub-classes in the case of retail) and business units within the group over time. The plan should be exacting yet realistic, and must be agreed with the Bank. It should be driven by the practicality of operations and the feasibility of moving towards adopting the more advanced approaches, and should not be dictated by the desire to minimise any capital charges. In this respect, during the roll-out period, no capital relief shall be allowed for any intra-group transactions that are designed to reduce banking group's aggregate capital charges by transferring credit risks among entities on either the standardised, foundation or advanced

[67] Generally, at entity level, conventional and Islamic assets can be combined as one asset class for IRB purposes.

[68] For example, residential mortgage is a sub-class of retail asset class.

IRB approaches. This includes, but is not limited to, asset sales or cross guarantees.

3.3 In general, the Bank would expect that all exposure classes or portfolios that represent material parts of a banking institution's businesses in terms of size or in terms of risk are covered by the IRB approach.

3.4 Permanent exemptions from the requirements set under paragraphs 3.1 to 3.3 **may** be granted at both entity and group level for the following exposures:

i) Exposures[69] to sovereigns, central banks, banking institutions and public sector entities (PSE)[70];

ii) Equity holdings in entities whose debt qualifies for 0% risk weight under the standardised approach;

iii) Equity investments called for by the Federal Government of Malaysia, Bank Negara Malaysia, Association of Banks in Malaysia, Association of Islamic Banking Institutions in Malaysia, or Malaysian Investment Banking Association[71] subject to a limit of 10% of the banking institution's Total Capital;

iv) Immaterial[72] equity holdings, as determined on a case-by-case basis; and

v) Entities and asset classes (or sub-classes in the case of retail) that are immaterial in terms of size and perceived risk profile. These exposures would be deemed immaterial if the aggregate credit RWA (computed using the standardised approach) of these exposures cumulatively account for less than or equal to 15% of total credit RWA of the banking institution at the group and entity level (not at asset class level). The RWA shall be determined net of credit risk mitigation.

---

69 Exemption may be applied where the number of material counterparties is limited and it would be unduly burdensome for the banking institution to implement a rating system for these counterparties.

70 Refer to **Part B.2.2** for the definition of PSEs.

71 Such as Cagamas Berhad and Credit Guarantee Corporation Malaysia Berhad.

72 Deemed material if the aggregate value, excluding those identified under paragraph 3.4(iii), exceeds on average over the prior year, 10% of banking institution's Total Capital. This threshold is lowered to 5% if the equity portfolio consists of less than 10 individual holdings.

3.5 Capital requirements for assets under permanent exemption will be determined according to the standardised approach. These exposures may attract additional capital under Pillar 2 if the Bank perceives that the regulatory capital calculated using the standardised approach is deemed insufficient vis-à-vis the level of risk. The Bank may also require banking institutions to adopt the IRB approach for these exposures if the approach is considered to be more appropriate to capture the risk levels [73].

3.6 Refer to the diagrammatic illustration and formulae for the computation of permanent exemption in **Appendix XXII**. For avoidance of doubt, investment in equities of non-financial commercial subsidiaries which are accorded a 1250% risk weight will not be included in the IRB coverage ratio computation.

3.7 For equity exposures, the Bank may require banking institutions to employ the PD/LGD or the internal models approach instead of the simple risk weight approach if a particular banking institution's equity exposures are a significant part of its business. These approaches are described in detail in **Part B.3.5**.

3.8 Once a banking institution has adopted the IRB approach for corporate exposures, it will be required to adopt the IRB approach for the Specialised Lending (SL) sub-classes within the corporate exposure class. However, a phased roll-out for SL sub-classes is allowed provided the banking institution can prove that the SL exposures do not represent a disproportionately high level of credit risk[74].

3.9 Given the data limitations associated with SL exposures, banking institutions may remain on the supervisory slotting criteria (SSC) approach for one or more of the SL sub-classes and move to the foundation or advanced approach for other sub-classes within the corporate asset class. However, banking institutions can only move the high volatility commercial real estate sub-class to

[73] For example, a small portfolio of exposures to high risk borrowers.
[74] This can be demonstrated by providing sufficient representative evidence that the SL exposures are generally of strong to satisfactory rating, based on the SSC in this framework.

the advanced approach only if it has done so for material income-producing real estate exposures. The approaches for SL exposures are described in detail in **Part 3.5**.

Adoption of IRB for Islamic Banking Assets

3.10 The IRB principles and methodologies outlined in this framework are also applicable to Islamic banking assets, subject to adherence to Shariah rules and principles. However, in determining the capital requirement for Islamic banking assets, it is important for banking institutions to understand the specificities of the products and the related risk profile based on the different Shariah contracts as described in **Appendix XXIII**. This includes the risk profile arising from the application of the 'look-through' approach for investment account placements made with Islamic banking institutions. The 'look-through' approach is described in **Appendix XXIV**.

3.11 Banking institutions that extend the application of an IRB model for conventional banking assets to the Islamic banking assets (within an entity or banking group) shall ensure that the models or approach adopted are representative of the risk profile of the Islamic banking assets. In this regard, banking institutions are required to:

i) Provide empirical analysis to support the case for using the conventional IRB model and its parameters for the Islamic banking assets prior to obtaining the Bank's approval for IRB migration;

ii) Perform periodic back-testing using Islamic banking asset data; and

iii) Collect data on Islamic banking assets by each Shariah contract for the purpose of future modelling requirements.

3.12 The possibility of Islamic banking institutions leveraging on the IRB infrastructure at the group level does not absolve Islamic banking institutions from the requirement to implement effective oversight arrangements at the entity level. Islamic banking institutions shall have in place an internal process in the bank and a formal avenue at group level to ensure that any outcome or decisions made at the group level is suitable and relevant for application at the

entity level. Similarly, banking institutions licensed under FSA with Islamic banking operations adopting the IRB approach across both its conventional and Islamic banking assets should also ensure the relevance and consistency of the application of the IRB approach for the Islamic banking assets.

Implementation Timelines and Transition Period

3.13 Banking institutions may adopt the IRB framework from 1 January 2010. The transition period will be applicable to certain banking institutions depending on the implementation timeline for migration to the IRB approach as described in **Appendix XXV**. Banking institutions are required to obtain prior written approval from the Bank before adopting the IRB framework.

3.14 During the transition period, in relation to the permanent exemption under paragraph 3.4(v), banking institutions may deem exposures to be immaterial if the aggregate credit RWA (computed using the standardised approach) of these exposures cumulatively account for less than or equal to 25% of total credit RWA of the banking institution at the group and entity level (not at asset class level). The RWA shall be determined net of credit risk mitigation. Banking institutions are required to revert to the threshold specified in paragraph 3.4(v) by the end of the transition period. Refer to the diagrammatic illustration and formulae for the computation of temporary exemption in **Appendix XXII**.

3.15 As most banking institutions intending to adopt the IRB approach are still in the process of strengthening their overall risk management capabilities involving data quality and risk measurement system enhancements and embedding the use of ratings into the day-to-day business processes in order to comply with the requirements set under this framework, full and immediate adherence to certain minimum requirements may not be possible at the time of implementation of this framework. As such, the Bank will allow certain flexibility during the transition period for certain minimum requirements relating to historical data observation period for risk estimation and use test:

Risk Estimation

i) At the start of the transition period, the minimum length of the underlying historical data observation period is two years for at least one data source. This flexibility applies to:

- PD estimation under foundation IRB for corporate, sovereign, and bank exposures;
- estimating loss characteristics (EAD, and either EL or PD and LGD) for retail exposures; and
- PD/LGD approach for equity.

This requirement will increase by one year for each of the three years of transition in a manner that the required minimum historical data of five years is achieved by the end of the transition period.

ii) Despite the flexibility allowed on the requirement of historical data, banking institutions are expected to use additional information which are relevant and of longer history[75] to reflect the following requirements:

- PD estimates must be representative of long-term average;
- LGD estimates for retail exposures must reflect downturn conditions; and
- EAD estimates for volatile retail exposures must also reflect downturn conditions.

Governance, Oversight and Use of Internal Ratings

iii) Banking institutions are only required to demonstrate that the rating systems that have been used, are broadly in line with the minimum requirements for at least one year prior to the start of the transition period for corporate, sovereign, bank, and retail exposures. A credible track record is required in all areas except for capital management and strategy which will only be required at the end of the transition period. By its very nature, the use of internal ratings is likely to improve as more experience and knowledge are gained by banking institutions. Therefore,

[75] Examples of such information include historical write-offs, historical provisions, historical NPL/impairment classifications, published bankruptcy rates, published default studies.

banking institutions should utilise the transition period as an opportunity to continually enhance the use of internal ratings.

3.16 Despite the flexibility given during the transition period, banking institutions would be required to demonstrate steady progress towards compliance with the full set of minimum requirements by the end of the transition period.

3.17 Banking institutions with shorter than three-year transition period should be mindful that full compliance with data and use test requirements must be achieved by the end of the transition period.

3.18 No transitional arrangement will be made available for banking institutions adopting the advanced IRB approach, other than for retail exposures. Adherence to all applicable minimum requirements from the outset is necessary given the increased reliance on banking institutions' internal assessments and the greater risk sensitivity of the advanced IRB approach.

Determination of Capital Requirements under the IRB approach

3.19 The determination of capital requirement under the IRB approach involves six critical segments as follows:

- Categories of exposures - categorisation of assets into six classes;
- Risk components - estimates of risk drivers or parameters namely PD, LGD, EAD and effective maturity (M);
- Credit risk mitigation;
- Risk weight functions - the means by which the risk components are transformed into RWA to compute capital requirements for UL;
- The treatment of EL; and
- Minimum requirements - the specific minimum standards for the use of the IRB approach for a given asset class.

3.20 There are six asset classes under the IRB approach. For many of the asset classes, there are two broad approaches - a foundation and an advanced approach as outlined below:

Asset Class	Available Approaches	Estimates
Corporate (including SL) Sovereign Bank	Foundation	Own PD, supervisory LGD, EAD and M
	Advanced	Own PD, LGD, EAD and M
	SSC (for SL, where requirements for estimation of PD, LGD and EAD are not met)	Supervisory risk weights
Retail	Advanced only	Own PD, LGD, EAD and M
Equity in the banking book	Market based - simple risk weight	Supervisory risk weights
	Market based - internal models	Own value-at-risk measure
	PD/LGD	Own PD and supervisory LGD
Purchased receivables	Foundation (not available for retail receivables)	Own PD, supervisory LGD, EAD and M
	Advanced	Own PD, LGD, EAD and M

3.21 Under the foundation approach, banking institutions provide internal estimates of PD and rely on supervisory estimates for other risk components. Under the advanced approach, banking institutions provide internal estimates of PD, LGD, EAD, and M.

3.22 For both the foundation and advanced approaches, banking institutions are expected to use risk weight functions provided under this framework for the purpose of deriving capital requirements. In the event that there is no specified IRB treatment for a particular exposure (and this exposure is not accorded 0% risk weight under the standardised approach), that exposure should be subject to 100% risk weight. The resulting RWA for such exposure is assumed to represent UL only[76].

[76] Banking institutions will not be required to compute EL for these exposures as elaborated under paragraph 3.221.

B.3.2 CATEGORIES OF EXPOSURES

3.23 Under the IRB approach, banking institutions must categorise banking book exposures into broad classes of assets with different underlying risk characteristics, consistent with the definitions set out below.

Definition of Corporate Exposures, including Specialised Lending

3.24 In general, a corporate exposure is defined as a debt obligation of a corporation, partnership, or proprietorship. Banking institutions may distinguish separately exposures to small and medium-sized corporates[77] from those to large corporates.

3.25 Exposures to securities firms, insurance companies, unit trust and asset management companies shall also be treated as exposures to corporates.

3.26 Within the corporate asset class, five sub-classes of SL are identified. Such lending would possess all of the following characteristics, either in legal form or economic substance:

i) The exposure is typically to a special purpose vehicle (SPV) created specifically to finance and/or operate physical assets;

ii) The borrowing entity has little or no other material assets or activities, and therefore little or no independent capacity to repay the obligation, apart from the income from the asset(s) being financed;

iii) The terms of the obligation give the banking institution a substantial degree of control over the asset(s) and the income that it generates; and

iv) Due to the factors in (i) to (iii) above, the primary source of repayment of the obligation is the income generated by the asset(s), rather than the independent capacity of a broader commercial enterprise.

[77] Defined as corporate exposures where the reported sales for the consolidated group of which the firm is a part is less than RM250 million.

3.27 The five sub-classes of SL are project finance, object finance, commodities finance, income-producing real estate, and high-volatility commercial real estate. Each of these sub-classes is defined below.

Project Finance

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

ii) In such transactions, the banking institutions are normally paid solely or almost exclusively from the proceeds generated by the project being financed, such as electricity sold by a power plant. The borrower is usually an SPV that is not permitted to perform any function other than developing, owning, and operating the installation. In contrast, if repayment of the exposure depends primarily on a well-established, diversified, credit-worthy, contractually obligated corporate end user for repayment, it is considered a collateralised claim on the corporate.

Object Finance

i) Object finance (OF) refers to a method of funding the acquisition of physical assets (not of the manufacturing of such physical assets type, which should be deemed as normal corporate or PF if it qualifies) that might include ships, aircraft, satellites, railcars, fleet of cars and trucks (mainly movable assets), where the repayment of the exposure is dependent on the cash flows generated by the specific assets that have been financed and pledged or assigned to the banking institution. A primary source of these cash flows might be rental or lease contracts with one or several third parties (hence a ring-fencing requirement). In contrast, if the exposure is to a borrower whose financial condition and

debt-servicing capacity enables it to repay the debt without undue reliance on the specifically pledged assets, the exposure should be treated as a collateralised corporate exposure.

Commodities Finance

i) Commodities finance (CF) refers to structured short-term lending to finance reserves, inventories, or receivables of exchange-traded commodities (e.g. crude oil, metals, or crops), where the exposure will be repaid from the proceeds of the sale of the commodity and the borrower has no independent capacity to repay the exposure. The structured nature of the financing is also designed to compensate for potential concerns relating to credit quality of the borrower. The exposure's rating reflects its self-liquidating nature and the banking institution's skill in structuring the transaction rather than the credit quality of the borrower.

ii) The Bank expects for CF to be distinguished from exposures financing the reserves, inventories, or receivables of other more diversified corporate borrowers. Banking institutions should rate the credit quality of the latter type of borrowers based on their broader ongoing operations. In such cases, the value of the commodity serves as a risk mitigant rather than as the primary source of repayment.

Income-Producing Real Estate

i) Income-producing real estate (IPRE) refers to a method of providing funding to real estate such as office buildings for rental, retail space, residential houses, multifamily residential buildings, industrial or warehouse space, and hotels, where the prospects for repayment and recovery (in the event of default) depend primarily on the cash flows generated by the asset/property. The primary source of these cash flows would generally be lease or rental payments or the sale of the asset. The borrower may be an SPV, an operating company focused on real estate construction or holdings, or an operating company with sources of revenue other than real estate. The distinguishing characteristic of IPRE versus other corporate exposures that are collateralised by real estate is

the strong positive correlation between the prospects for repayment of the exposure and the prospects for recovery in the event of default, with both depending primarily on the cash flows generated by a property.

High-Volatility Commercial Real Estate

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

- Loans financing any of the land acquisition, development and construction (ADC) phases for such properties (excluding residential-related development); and
- Loans financing ADC for any other properties where, unless the borrower has substantial equity at risk, the source of repayment at origination of the exposure is either:
  - the future uncertain sale of the property; or
  - cash flows whose source of repayment is substantially uncertain (e.g. the property has not yet been leased up to the occupancy rate normally prevailing in that geographic market for that type of commercial real estate[78]).

  Commercial ADC loans exempted from treatment as HVCRE loans on the basis of certainty of repayment of borrower equity are, however, ineligible for the preferential risk weights for SL exposures described in paragraph 3.168.
- Commercial real estate exposures secured by other properties that are specifically categorised by the Bank from time to time as sharing higher volatilities in portfolio default rates.

Definition of Sovereign Exposures

3.28 This asset class covers exposures to sovereigns and central banks. It also includes exposures to Multilateral Development Banks (MDBs) that meet the

[78] Where only booking fee has been obtained, instead of the signing of sales and purchase agreement or rental/lease agreement, which would cause this exposure to be classified as IPRE.

criteria for a 0% risk weight[79] under the standardised approach, the Bank for International Settlements, the International Monetary Fund, the European Central Bank and the European Community.

Definition of Bank Exposures

3.29 This asset class mainly covers exposures to other banking institutions. It also includes the following:

- Claims on domestic non-federal government PSEs that are eligible for 20% risk weight under the standardised approach; and
- Claims on MDBs that do not meet the criteria for 0% risk weight under the standardised approach.

Definition of Retail Exposures

3.30 Retail exposures are exposures that meet all the following criteria[80]:

- Exposures to individuals[81]; or
- Loans extended to small businesses and managed as retail exposures, provided that the total exposure of the banking group to the small business borrower (on a consolidated basis, where applicable) is less than RM5 million. Small business loans extended through or guaranteed by an individual are subject to the same exposure threshold. Small businesses may include sole proprietorships, partnerships or small and medium-sized enterprises (SMEs)[82]; and
- The specific exposure must be part of a large group of exposures, which are managed by the banking institution on a pooled basis.

---

79 Refer to **Part B.2.2** for the definition of MDBs.

80 For Islamic banking assets, the retail exposures shall be based on contracts that create a similar credit risk profile to those commonly structured using the *Murābahah* or *Ijārah/Ijārah Muntahia Bittamleek* contract. The specificities of these *Shariah* contracts are elaborated in **Appendix III**.

81 Includes residential mortgages, revolving credits and lines of credit (e.g. credit cards, overdrafts and retail facilities secured by financial instruments) as well as personal term loans and leases (e.g. instalment loans, auto loans and leases, student and educational loans, personal finance) and other exposures with similar characteristics.

82 SMEs in the agriculture and services sector are defined as having annual sales of up to RM5 million or 50 full-time employees. For the manufacturing sector, SMEs have been defined as having annual sales of up to RM25 million or 150 full-time employees.

3.31 Small business exposures below RM5 million may be treated as retail exposures if the banking institution treats such exposures in its internal risk management systems consistently over time and in the same manner as other retail exposures. This requires for such exposures to be originated in a similar manner to other retail exposures. Furthermore, it must not be managed individually in a way comparable to corporate exposures, but rather as part of a portfolio segment or pool of exposures with similar risk characteristics for purposes of risk assessment and quantification[83].

3.32 Notwithstanding paragraphs 3.30 and 3.31, banking institutions implementing the IRB approach are required to have in place and effectively implement policies and procedures which outline triggers for closer monitoring with corresponding actions (e.g. re-rating using a different scorecard) that should be taken in respect of larger exposures. This applies to both exposures to individuals as well as exposures to small businesses below the prescribed regulatory threshold.

3.33 Within the retail asset class, banking institutions are required to identify separately three sub-classes of exposures:

- exposures secured by residential properties;
- qualifying revolving retail exposures; and
- all other retail exposures.

I. Exposures Secured by Residential Properties

3.34 Exposures are defined as secured by residential properties[84] if the following criteria are met[85]:

i) the borrower is an individual person/s;

[83] The fact that an exposure is rated individually does not by itself deny its eligibility as a retail exposure.

[84] Residential property means property which is zoned for single-family homes, multi-family apartments, townhouses and condominiums. It excludes shophouses which is categorised under other retail exposures.

[85] Also applicable to financing structured under the Diminishing *Mushārakah* contract where the exposures are secured by residential properties.

ii) the residential properties are or will be occupied by the borrower, or is rented;

iii) the loan is secured by first and subsequent legal charges, deeds of assignment or strata titles on the property; and

iv) the property has been completed and a certificate of fitness has been issued by the relevant authority.

Such exposures include term loans and revolving home equity lines of credit.

II. Qualifying Revolving Retail Exposures

3.35 Qualifying revolving retail exposures (QRRE) generally include revolving credits and lines of credit such as credit cards and overdrafts. All the following criteria must be satisfied for a sub-portfolio to qualify as QRRE. These criteria must be applied at the sub-portfolio level, consistent with the banking institution's retail segmentation approach:

i) The exposures are revolving[86], unsecured, and uncommitted (both contractually and in practice);

ii) The exposures are to individuals;

iii) The maximum exposure to a single individual in the sub-portfolio is RM500,000 or less;

iv) Given the asset correlation assumptions for the QRRE risk weight function are markedly below those for the other retail risk weight function at low PD values, the banking institution must demonstrate that exposures identified as QRRE correspond to portfolios with low volatility of loss rates, relative to the average volatility of loss rates of portfolios within the low PD bands;

v) Data on loss rates for the sub-portfolio must be retained in order to allow analysis of the volatility of loss rates; and

vi) The treatment as a QRRE is consistent with the underlying risk characteristics of the sub-portfolio.

[86] 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.

III. Other Retail Exposures

3.36 Exposures that do not meet the criteria under paragraphs 3.34 or 3.35 will be categorised as other retail exposures.

Definition of Equity Exposures

3.37 In general, equity exposures are defined on the basis of the economic substance of the instrument. It would include both direct and indirect ownership interests[87], whether voting or non-voting, in an entity that is not consolidated or deducted pursuant to the Capital Adequacy Framework (Capital Components)[88]. An instrument is considered to be an equity exposure if it meets all of the following requirements:

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

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

- an instrument with features similar to those which qualify as Tier 1 Capital for banking institutions; or
- an instrument that is an obligation on the part of the issuer and meets any of the following conditions:
  - the issuer may defer the settlement of the obligation indefinitely;
  - the obligation requires (or permits at the issuer's discretion) settlement by issuance of a fixed number of the issuer's equity shares;
  - the obligation requires (or permits at the issuer's discretion) settlement by issuance of a variable number of the issuer's equity shares and where

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

[88] Where other countries retain their existing treatment as an exception to the deduction approach, such equity investments by IRB banking institutions are to be considered eligible for inclusion in their IRB equity portfolios.

changes in the value of the obligation is attributable and comparable to the change in the value of a fixed number of the issuer's equity shares[89]; or,

- the holder has the option to require settlement in equity shares, unless the banking institution is able to demonstrate to the Bank that the instrument merits to be treated as a debt[90]. In such cases, the banking institution may decompose the risks for regulatory purposes, with the consent of the Bank.

3.39 Debt obligations and other securities, partnerships, investments in funds[91] (e.g. collective investment schemes, unit trusts), derivatives or other vehicles structured with the intent of conveying the economic substance of equity ownership are considered an equity holding[92]. This includes liabilities from which the return is linked to that of equities[93]. Conversely, instruments that are structured with the intent of conveying the economic substance of debt holdings (e.g. investments in funds which solely contain non-equity type of instruments) or securitisation exposures would not be considered an equity holding.

3.40 The Bank reserves the right to re-categorise debt holdings as equities for regulatory purposes to ensure consistent and appropriate treatment of holdings.

Definition of Purchased Receivables Exposures

3.41 Purchased receivables refers to exposures from refinancing, factoring or discounting facilities granted by a banking institution based on the security of the debt agreements assigned from the original financier/seller. The facilities

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

90 For example, where the instrument trades more like a debt of the issuer than its equity.

91 Investments in funds will normally be treated as equity exposures subject to paragraphs 3.91 and 3.92.

92 Equities that arise from a debt/equity swap made as part of the orderly realisation or restructuring of the debt are included in the definition of equity holdings.

93 The Bank may decide not to require that such liabilities be included where they are directly hedged by an equity holding, such that the net position does not involve material risk.

may or may not be with recourse to the seller. Transactions for loans originated by one banking institution and subsequently bought by another to hold on its books are excluded from this definition. Eligible purchased receivables are divided into retail and corporate receivables as defined below.

I. Retail Receivables

3.42 Purchased retail receivables, provided the purchasing banking institution complies with the IRB rules for retail exposures, are eligible for the top-down approach as permitted for retail exposures under paragraphs 3.82 to 3.88. Under the top-down approach, the risk weight for the receivables pool is based on *pool-level* estimates of PD, LGD, or EL. The banking institution must also apply the minimum requirements as set forth in paragraphs 3.349 to 3.351.

II. Corporate Receivables

3.43 In general, for purchased corporate receivables, banking institutions are expected to assess the default risk of individual receivables obligors as specified in **Part B.3.5** consistent with the treatment of other corporate exposures. For purchased corporate receivables, this will be referred to as the bottom-up approach. However, the top-down approach may be permitted by the Bank, provided that the purchasing banking institution's programme for corporate receivables complies with both the criteria for eligible receivables and the minimum requirements of the top-down approach. The use of the top-down purchased receivables treatment is limited to situations where it would be an undue burden to apply the minimum requirements under the IRB approach that would otherwise apply to corporate exposures. Primarily, it is intended for receivables that are purchased for inclusion in asset-backed securities, but banking institutions may use this approach, with the Bank's approval, for appropriate on-balance sheet exposures that share the same features.

3.44 To be eligible for the 'top-down' treatment, purchased corporate receivables must satisfy the following conditions:

- The receivables are purchased from unrelated, third party sellers, and the banking institution has not originated the receivables either directly or indirectly;
- The receivables must be generated on an arm's-length basis between the seller and the receivables obligor. (Consequently, inter-company accounts receivable and receivables that are subjected to contra-accounts[94] between firms are excluded);
- The purchasing banking institution has a claim on all proceeds from the pool of receivables or on a pro-rata interest in the proceeds[95]; and
- The receivables do not exceed any of the following concentration limits:
  - The size of the purchased corporate receivables pool do not exceed 10% of the banking institution's Total Capital;
  - The size of one individual exposure relative to the total pool does not exceed 0.2%.

  If the concentration limits are exceeded, capital charges must be calculated using the minimum requirements for the bottom-up approach for corporate exposures.

3.45 The existence of full or partial recourse to the seller does not automatically disqualify banking institution from adopting this top-down approach provided the cash flows from the purchased corporate receivables are the primary protection against default risk, as determined by the rules in paragraphs 3.200 to 3.203. In addition, the banking institution must fulfil the eligibility criteria and minimum requirements.

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

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

B.3.3 RISK COMPONENTS

Risk Components for Corporate, Sovereign and Bank Exposures

3.46 There are two approaches that could be used under the IRB approaches for corporate, sovereign and bank exposures, namely the foundation and advanced approaches. For SL exposures, where banking institutions do not meet the minimum requirements for the estimation of PD, the banking institution must apply the SSC approach (outlined in paragraphs 3.166 to 3.169).

Risk Components under the Foundation IRB Approach

I. Probability of Default (PD)

3.47 PD for corporate, sovereign and bank exposures is defined as a one-year PD associated with the internal borrower grade to which that exposure is assigned to, subject to a floor of 0.03% in the case of corporate and bank exposures. The PD assigned to a default grade is 100%. The minimum requirements for the derivation of the PD estimates are outlined in paragraphs 3.315 to 3.317.

II. Loss Given Default (LGD)

3.48 An estimate of LGD must be applied for each corporate, sovereign and bank exposure. Under the foundation approach, LGD estimates are determined by the Bank separately for:

i) unsecured exposures;

ii) exposures secured by eligible financial and non-financial collateral (including specified commercial and residential real estate (CRE/RRE), financial receivables and other physical collateral subject to the requirements in paragraphs 3.124 to 3.127); and

iii) exposures secured by guarantees and credit derivatives.

The eligible collateral, detailed methodology and minimum requirements for the use of supervisory LGD estimates for (ii) and (iii) are detailed in **Part B.3.4** as well as in paragraphs 3.338 to 3.348.

Treatment of Unsecured Claims

3.49 Under the foundation approach, unsecured senior claims on corporates, sovereigns, banks and those not secured by a recognised collateral will be assigned LGD of 45%.

3.50 All subordinated claims on corporates, sovereigns and banks will be assigned LGD of 75%. A subordinated claim is a facility that is expressly subordinated (having a lower priority or claim against the borrower) to another facility.

3.51 Islamic banking assets structured using *Mushārakah* or *Mudārabah* contracts are required to apply LGD of 90%[96].

Treatment of Claims Secured by Eligible Financial and Non-Financial Collateral

3.52 Banking institutions that adopt the foundation approach are allowed to recognise eligible financial and non-financial collateral as prescribed under paragraphs 3.97 to 3.102, subject to compliance with specific requirements under paragraphs 3.118 to 3.127.

3.53 There are two methodologies for incorporating the effects of eligible collateral in calculating the LGD:

i) For eligible financial collateral, the effective LGD will be calculated by weighting down the LGD with the percentage of exposure after risk mitigation (E*/E), where E* will be based on the comprehensive approach; and

ii) For eligible non-financial collateral, the effective LGD will be determined based on the level of over-collateralisation of the exposure.

These methodologies are explained further in paragraphs 3.103 to 3.117.

[96] This refers to *Mushārakah* and *Mudārabah* exposures that have characteristics similar to a debt. *Mushārakah* and *Mudārabah* exposures with characteristics similar to equities will be subject to the requirements under paragraphs 3.178 to 3.196. However, for *Mudārabah* interbank transactions, the treatment in paragraphs 3.49 or 3.50 shall apply.

Treatment of Claims Secured by Guarantees and Credit Derivatives

3.54 Banking institutions adopting the foundation approach are only allowed to recognise eligible guarantors and protection providers as prescribed in paragraphs 3.128 to 3.129, subject to meeting specific requirements under paragraphs 3.139 to 3.144.

3.55 There are two methodologies for treating guarantees and credit derivatives:

i) The substitution method, closely similar to that adopted under the standardised approach; and

ii) The double default method, for exposures hedged by certain instruments.

The methodologies are explained further in paragraphs 3.130 to 3.138.

III. Exposure at Default (EAD)

3.56 All exposures are measured gross of specific provisions[97] or partial write-offs. The EAD on drawn amounts should not be less than the sum of:

i) the amount by which a banking institution's regulatory capital would be reduced if the exposure were written-off fully; and

ii) any specific provisions and partial write-offs.

3.57 The calculation of RWA is independent of any discount which is defined as the instrument's EAD that exceeds the sum of (i) and (ii). Under the limited circumstances described in paragraph 3.227, discounts may be included in the measurement of total eligible provisions for purposes of the EL-provision calculation set out in **Part B.3.6**.

Exposure Measurement for On-Balance Sheet Items

3.58 On-balance sheet netting of loans and deposits will be recognised subject to the requirements under paragraphs 3.145 to 3.147. Where currency or maturity

[97] Specific provisions refer to loss allowance measured at an amount equal to lifetime expected credit losses for credit-impaired exposures as defined under the Malaysian Financial Reporting Standards 9. These provisions are commonly known as Stage 3 provisions.

mismatched on-balance sheet netting exists, the treatment is set out in paragraphs 3.134 and 3.155 to 3.158.

Exposure Measurement for Off-Balance Sheet Items (with the exception of FX, Interest-Rate, Equity, and Commodity-Related Derivatives)

3.59 For off-balance sheet items, exposure is calculated as the committed but undrawn amount multiplied by a credit conversion factor (CCF). For the foundation approach, the CCF is determined by the Bank and would be the basis for calculating the off-balance sheet exposure.

3.60 The types of instruments and the applicable CCFs are outlined in **Appendix XXVI**. The CCFs are essentially the same as those under the standardised approach, with the exception of commitments, Note Issuance Facilities (NIFs) and Revolving Underwriting Facilities (RUFs).

3.61 A CCF of 75% will be applied to commitments, NIFs and RUFs regardless of the maturity of the underlying facility, except in cases where paragraph 3.62 applies.

3.62 Any commitments that are unconditionally and immediately cancellable and revocable by the banking institution or that effectively provide for automatic cancellation due to deterioration in a borrower's creditworthiness (for example, corporate overdrafts and other facilities), at any time without prior notice, will be subject to 0% CCF. To utilise the 0% CCF, the banking institution must demonstrate that legally, it has the ability to cancel these facilities and that its internal control systems and monitoring practices are adequate to support timely cancellations which the banking institution does effect in practice upon evidence of a deterioration in a borrower's creditworthiness. Banking institutions should also be able to demonstrate that such cancellations have not exposed the banking institution to legal actions, or where such actions have been taken, the courts have decided in favour of the banking institution.

3.63 The amount to which the CCF is applied is the lower of:

i) the value of the unused committed credit line, and

ii) the value corresponding to possible constraints on the availability of the facility, such as a ceiling imposed on the potential lending amount which is related to a borrower's reported cash flow.

For such facilities, banking institutions must have adequate credit line monitoring and management procedures in place to administer the constraints in a consistent, timely and effective manner. Banking institutions must be able to demonstrate that breaches of internal controls or exceptions granted for such facilities in the past, if any, are rare and appropriately justified.

3.64 Where a commitment is obtained on another off-balance sheet exposure[98], banking institutions are to apply the lower of the applicable CCFs.

Exposure Measurement for Transactions with Counterparty Credit Risk Exposures

3.65 Measures of counterparty credit risk exposure arising from over-the-counter (OTC) derivative positions, securities financing transactions (SFT)[99] and Sell and Buy Back Agreements (SBBA) under the IRB approach are based on the rules set forth in **Part B.3.4, Appendix VIII, and Appendix XIX**.

IV. Effective Maturity (M)

3.66 Under the foundation approach, a banking institution-

(a) must adopt a fixed M of 2.5 years; or

(b) upon notifying the Bank, may internally estimate the M based on the requirements under paragraph 3.75,

except for repo-style transactions where the M shall be 6 months. However, if in the opinion of the Bank there is a significant risk of underestimation of capital

[98] Such as commitments to provide letters of credit or guarantees for trade purposes. An example is where a banking institution provides the customer with a committed limit on the amount of letters of credit they can issue over a one-year period, with the customer drawing on this committed limit over time.

[99] Securities financing transactions are transactions such as repurchase agreements, reverse repurchase agreements, securities lending and borrowing, and margin lending transactions, where the value of the transactions are often subject to margin agreements.

using the fixed M, the Bank may require institutions to adopt the internal estimate method of M as defined in paragraph 3.75. In addition, if the banking institution lacks internal capability to adopt the internal estimate method, the Bank may require the institution to adopt the fixed method of M.

Risk Components under the Advanced IRB Approach

I. Probability of Default (PD)

3.67 Treatment of PD under the advanced approach is similar to the foundation approach as specified in paragraph 3.47.

II. Loss Given Default (LGD)

3.68 Under the advanced approach, banking institutions are allowed to use internal estimates of LGD for corporate, sovereign and bank exposures. The methodology used in arriving at the LGD estimates is subject to additional minimum requirements specified in paragraphs 3.322 to 3.326, 3.330. LGD must be measured as a percentage of the EAD.

3.69 When the claims are secured by collateral, banking institutions must also establish internal requirements for collateral that are generally consistent with the general requirements for recognition of credit risk mitigation and the specific requirements for transactions secured by eligible financial collateral, eligible CRE/RRE, financial receivables and other physical collateral (set out in **Part B.3.4**).

Treatment of Claims Secured by Guarantees and Credit Derivatives

3.70 The risk mitigating effect of guarantees and credit derivatives may be reflected through the following:

i) by adopting the substitution method or the double default method specified under the foundation IRB approach; or

ii) either adjusting PD or LGD estimates. Whether adjustments are done through PD or LGD, they must be done in a consistent manner for a given guarantee or credit derivative type. In doing so, banking institutions must not include the effect of double default in such adjustments. Thus,

the adjusted risk weight must not be less than that of a comparable direct exposure to the protection provider.

3.71 Except as specified in the double default method, there are no limits to the range of eligible guarantors although the minimum requirements for guarantees and requirements for credit derivatives must be satisfied as set out in paragraphs 3.338 to 3.348.

Treatment of Certain Repo-style Transactions

3.72 In addition to the methodology specified in paragraph 3.104, own LGD estimates would be permitted for the unsecured equivalent amount (E*).

III. Exposure at Default (EAD)

3.73 Under the advanced approach, the general definition and the treatment for on-balance sheet items are similar to the foundation approach as specified in paragraphs 3.56 to 3.58.

3.74 For off-balance sheet items, banking institutions are allowed to use internal estimates of EAD across different product types, provided that the minimum requirements for own estimates of EAD from paragraphs 3.332 to 3.336 are met and the exposure is not subject to a CCF of 100% in the foundation approach as specified in **Appendix XXVI**. For transactions that expose banking institutions to counterparty credit risk, the requirement stipulated in paragraph 3.65 applies.

IV. Effective Maturity (M)

3.75 Under the advanced IRB approach, M is measured for each facility as defined below (except as noted in paragraph 3.76):

i) For an instrument subject to a determined cash flow schedule, remaining M is defined as:

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

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

ii) The estimated M must be performed on a pooled basis for exposures that are sufficiently homogenous.

iii) If a banking institution is unable to calculate the M of the contracted payments using the formula above, the nominal maturity of the instrument under the terms of the loan agreement may be used[100].

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

v) For revolving exposures, M must be determined using the maximum contractual termination date of the facility. Banks must not use the repayment date of the current drawing.

vi) Notwithstanding paragraph 3.75(v), a banking institution must build in a sufficient level of conservatism in the computation of M for facilities which are "rolled over" beyond the maximum contractual tenure.

vii) In all cases, M will be greater than one year but no greater than five years.

3.76 The one-year floor does not apply to certain short-term exposures, comprising fully or nearly-fully collateralised[101] capital market-driven transactions (i.e. OTC derivatives transactions and margin lending) and repo-style transactions (i.e. repos/reverse repos and securities lending/borrowing) with an original maturity of less than one year, where the documentation contains daily remargining clauses. For all eligible transactions, the documentation must require daily revaluation, and must include provisions that must allow for the prompt liquidation or setoff of the collateral in the event of default or failure to re-margin.

[100] Normally, this would equate to the maximum remaining time (in years) that the borrower is permitted to take to fully discharge its contractual obligation (principal, interest, and fees) under the terms of loan agreement.

[101] The intention is to include both parties of a transaction meeting these conditions where neither of the parties is systematically under-collateralised.

The maturity of such transactions must be calculated as the greater of one-day, and the M.

3.77 In addition to the transactions considered in paragraph 3.76 above, other short-term exposures with an original maturity of less than three months that are not part of a banking institution's ongoing financing of an obligor may be eligible for exemption from the one-year floor. The types of short-term exposures that might be considered eligible for this treatment include transactions such as:

- Some capital market-driven transactions and repo-style transactions that might not fall within the scope of paragraph 3.76;
- Some short-term self-liquidating trade transactions. Import and export letters of credit and similar transactions could be accounted for at the actual remaining maturity;
- Some exposures arising from settling securities purchases and sales. This could also include overdrafts arising from failed securities settlements provided that such overdrafts do not continue for more than a short, fixed number of business days;
- Some exposures arising from cash settlements by wire transfer, including overdrafts arising from failed transfers provided that such overdrafts do not continue for more than a short, fixed number of business days;
- Some exposures to banks arising from foreign exchange settlements; and
- Some short-term loans and deposits.

3.78 For transactions within the scope of paragraph 3.76 subject to a master netting agreement, the weighted average maturity of the transactions should be used when applying the explicit maturity adjustment. A floor equal to the minimum holding period for the transaction type set out in paragraph 2.122 will apply to the average. Where more than one transaction type is contained in the master netting agreement a floor equal to the highest holding period will apply to the average. Further, the notional amount of each transaction should be used for weighting maturity.

3.79 Where there is no explicit adjustment, the M assigned to all exposures will be similar to the foundation approach as specified in paragraph 3.66 except for repo-style transactions where the M will be 6 months.

3.80 Notwithstanding the flexibility given to banking institutions, the Bank reserves the right to require institutions that adopt the foundation approach to measure M using the definition contained in paragraph 3.75.

Treatment of Maturity Mismatches

3.81 The treatment for maturity mismatches under IRB is provided in paragraphs 3.155 to 3.158.

Risk Components for Retail Exposures

I. Probability of Default (PD) and Loss Given Default (LGD)

3.82 For each identified pool of retail exposures, banking institutions must provide an estimate of the PD and LGD associated with the pool, subject to the minimum requirements as set out in **Part B.3.7**. Additionally, the PD for retail exposures is the greater of the one year PD associated with the internal borrower grade to which the pool of retail exposures is assigned or 0.03%.

Recognition of Guarantees and Credit Derivatives

3.83 Banking institutions may reflect the risk-mitigating effects of guarantees and credit derivatives in support of an individual exposure or a pool of exposures, through an adjustment to either the PD or LGD estimate, subject to the minimum requirements in paragraphs 3.338 to 3.348. Whether adjustments are done through PD or LGD, it must be done in a consistent manner for a given guarantee or credit derivative type.

3.84 Banking institutions must not include the effect of double default in such adjustments[102]. The adjusted risk weight must not be less than a comparable direct exposure to the protection provider.

II. Exposure at Default (EAD)

3.85 For the purpose of measuring EAD, both on and off-balance sheet retail exposures are measured gross of specific provisions or partial write-offs. The EAD on drawn amounts should not be less than the sum of:

i) the amount by which a banking institution's regulatory capital would be reduced if the exposure were fully written-off, and

ii) any specific provisions and partial write-offs.

When the difference between the instrument's EAD and the sum of (i) and (ii) is positive, this amount is termed a discount. The calculation of RWA is independent of any discounts. Under the limited circumstances described in paragraph 3.227 discounts may be included in the measurement of total eligible provisions for purposes of the EL-provision calculation set out in **Part B.3.6**.

3.86 On-balance sheet netting of loans and deposits of a banking institution to or from a retail customer is permitted subject to the same conditions in paragraphs 3.145 to 3.147. For retail off-balance sheet items, banking institutions could use internal CCF estimates provided the relevant minimum requirements in paragraphs 3.332 to 3.335 and 3.337 are met.

3.87 For retail exposures with uncertain future drawdown such as credit cards, banking institutions must take into account credit history and/or expectation of additional drawings prior to default in the overall calibration of loss estimates. In particular, where conversion factors for undrawn lines are not reflected in EAD

[102] The recognition of double default implies that the risk of both the borrower and the guarantor/protection provider defaulting on the same obligation may be substantially lower than the risk of only one of the parties defaulting. In the substitution approach, the maximum capital benefit that may be obtained is only up to the reduction in the capital requirement through replacing the exposure to the borrower with one to the protection provider. This assumes perfect correlation between the borrowers with the protection provider and will not fully reflect the lower risk that both the borrower and guarantor must default for a loss to be incurred.

estimates, the likelihood of additional drawings prior to default must be reflected in the LGD estimates. Conversely, if banking institutions do not incorporate the possibility of additional drawings in its LGD estimates, they must do so in its EAD estimates.

3.88 When only the drawn balances of retail facilities have been securitised, banking institutions must continue to hold the required capital against the share (i.e. seller's interest) of undrawn balances related to the securitised exposures, using the IRB approach to credit risk. This means that for such facilities, banking institutions must reflect the impact of CCFs in the EAD estimates rather than in the LGD estimates. For determining the EAD associated with the seller's interest in the undrawn lines, the undrawn balances of securitised exposures would be allocated between the seller's and investor's interests[103] on a pro rata basis, based on the proportions of the seller's and investor's shares of the securitised drawn balances.

3.89 To the extent that foreign exchange and interest rate commitments exist within banking institutions' retail portfolio for IRB purposes, banking institutions are not permitted to use internal assessments of credit equivalent amounts. Instead, the rules for the standardised approach would apply.

Risk Components for Equity Exposures

3.90 In general, the value of an equity exposure on which capital requirements is based is defined under the applicable Financial Reporting Standards as follows:

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

[103] The investor's share of undrawn balances related to the securitised exposures shall be subject to the treatment specified in the securitisation component of this framework.

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

3.91 Investments in funds (e.g. collective investment schemes, unit trusts) containing both equity investments and other non-equity types of investments can be treated either as a single investment based on the majority of the fund's holdings or as separate and distinct investments in the fund's component holdings based on a look-through approach. Banking institutions must demonstrate to the Bank that the chosen treatment is appropriate for the portfolio (for example, that regulatory arbitrage considerations have not influenced their choice) and applied in a consistent manner. The Bank reserves the right to require banking institutions to compute capital using the more appropriate treatment where the Bank is satisfied that the exposures are or are likely to become significant and the particular treatment used by the banking institution would lead to consistent underestimation of risk of that portfolio.

3.92 Where only the investment mandate of the fund is known, the fund can still be treated as a single investment. For calculating capital requirement, it is assumed that the fund first invests, to the maximum extent allowed under its mandate, in the asset classes that attract the highest capital charge and followed by, in descending order, the next highest requirement until the maximum total investment level is reached. The same approach can also be used for the look-through approach, but only where banking institutions have rated all the potential underlying assets of the fund.

B.3.4 CREDIT RISK MITIGATION (CRM)

3.93 This section outlines general requirements for the use of credit risk mitigation and eligibility criteria, detailed methodologies and specific requirements with respect to the following CRM techniques:

i) Collateralised transactions (refer to paragraphs 3.97 to 3.127)

ii) Guarantee and credit derivatives (refer to paragraphs 3.128 to 3.144)

iii) On-balance sheet netting (refer to paragraphs 3.145 to 3.147)

3.94 While the use of CRM techniques reduces or transfers credit risk, it may introduce or increase other risks such as legal, operational, liquidity and market risk. Therefore, it is imperative that banking institutions control these risks by employing robust policies, procedures and processes including strategies to manage these risks, valuation, systems, monitoring and internal controls. Banking institutions must be able to demonstrate to the Bank that it has adequate risk management policies and procedures in place to control risks arising from the use of CRM techniques. In any case, the Bank reserves the right to take supervisory action under Pillar 2 should the banking institution's risk management in relation to the application of CRM techniques be deemed insufficient. In addition, banking institutions will also be expected to observe the Pillar 3 requirements in order to obtain capital relief in respect of any CRM techniques.

Minimum Conditions for the Recognition of Credit Risk Mitigation Techniques

3.95 To obtain capital relief for use of any CRM technique, the following general requirements must be fulfilled:

- 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;
- Sufficient assurance from legal counsel with respect to the legal enforceability of the documentation;
- Periodic review is undertaken to confirm the ongoing enforceability of the documentation; and
- For Islamic banking assets, the collateral must be Shariah-compliant.

3.96 In general, only collateral and/or guarantees that are actually posted and/or provided under a legally enforceable agreement are eligible for CRM purposes. A commitment to provide collateral or a guarantee is not recognised as an eligible CRM technique until the commitment to do so is actually fulfilled[104].

[104] However, under the foundation IRB, in accordance with paragraph 3.280 and 3.281, forms of group support may be reflected via PD but not LGD.

Collateralised Transactions

I. Eligible Collateral

3.97 Under the foundation IRB approach, there are four categories of eligible collateral recognised, namely financial collateral, commercial and residential real estate (CRE and RRE) collateral, financial receivables and other physical collateral.

Eligible Financial Collateral

3.98 The following financial instruments are recognised as eligible financial collateral:

Eligible Financial Collateral
▪ Cash[105] (including certificate of deposits or comparable instruments issued by the lending banking institution) on deposit[106] with the banking institution which is incurring the counterparty exposure[107] ▪ Gold ▪ Debt securities/*Sukūk* rated by recognised ECAIs where the risk weight attached to the debt securities is lower than that of the borrower ▪ Debt securities/*Sukūk* unrated by a recognised ECAI but fulfil the following conditions: ➢ Issued by a banking institution; ➢ Listed on a recognised exchange; ➢ Classified as senior debt; ➢ All rated issues of the same seniority by the issuing banking institution that are rated at least BBB- or A-3/P-3; and ➢ The Bank is sufficiently confident about the market liquidity of the debt security/*sukūk*. ▪ Equities (including convertible bonds/*sukūk*) that are listed on a recognised exchange (refer to **Appendix X**) ▪ Funds (e.g. collective investment schemes, unit trust funds, mutual funds etc.) where: ➢ A price for the units is publicly quoted daily, and ➢ The funds are limited to investing in financial instruments recognised as eligible financial collateral.[108]

[105] Cash pledged includes `*urbūn* (or earnest money held after a contract is established as collateral to guarantee contract performance) and *hamish jiddiyyah* (or security deposit held as collateral) in Islamic banking contracts (e.g. *Ijārah*).

[106] Structured deposits and Restricted Investment Accounts would not qualify as eligible financial collateral.

[107] Cash funded credit linked notes issued by the banking institution against exposures in the banking book which fulfil the criteria for credit derivatives will be treated as cash collateralised transactions.

[108] The use or potential use by a fund of derivative instruments solely to hedge investments listed in this table shall not prevent units in that fund from being an eligible financial collateral.

Eligible CRE and RRE Collateral

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

- Collateral where the risk of the borrower is not materially dependent upon the performance of the underlying property or project, but rather on the underlying capacity of the borrower to repay the debt from other sources. As such, facility repayment is not materially dependent on the cash flow from the underlying CRE/RRE serving as collateral, and
- Additionally, the value of the collateral pledged must not be materially dependent on the performance of the borrower[109].

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

Eligible Financial Receivables

3.101 Eligible financial receivables are claims with an original maturity of less than or equal to one year where repayment will occur through the commercial or financial flow related to the underlying assets of the borrower. This includes both self-liquidation debt arising from the sale of goods or services linked to a commercial transaction and general amounts owed by buyers, suppliers, renters, national and local governmental authorities or other non-affiliated parties not related to the sale of goods or services linked to a commercial transaction. Eligible receivables do not include those associated with securitisations, sub-participations or credit derivatives.

Other Eligible Physical Collateral

3.102 Banking institutions may also recognise other physical collateral subject to conditions specified in paragraphs 3.127 being fulfilled.

[109] This requirement is not intended to preclude situations where purely macro-economic factors affect both the value of the collateral and the performance of the borrower.

II. Methodology

Methodology for Transactions Secured by Eligible Financial Collateral

3.103 Banking institutions adopting the foundation approach must calculate the effective loss given default (LGD*) applicable to a transaction secured by eligible financial collateral, which is expressed as:

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

where:

i) LGD is that of the senior unsecured exposure before recognition of collateral (45%);

ii) E is the current value of the exposure (cash or securities lent or posted);

iii) E* is the adjusted exposure value after risk mitigation as determined under the comprehensive approach as specified in paragraphs 3.106 to 3.111[110].

3.104 Where repo-style transactions are subject to a master netting agreement, banking institutions may choose to recognise the netting effects in calculating capital requirement if the criteria provided in paragraphs 3.112 to 3.114 can be met. In such cases, banking institutions must calculate E* in accordance with paragraphs 3.115 or the use of VAR modelling (refer to paragraphs 2.133 to 2.136) and equate this to EAD. The impact of collateral on these transactions cannot be reflected through adjustment to LGD.

3.105 A zero haircut may be applied for transactions where the conditions for zero haircut are met and the counterparty is a core market participant (refer to paragraphs 2.125 to 2.128).

[110] Under the foundation approach, E* is used only as input to calculate LGD*. Banking institutions must continue to calculate EAD without taking into account the presence of any collateral, unless otherwise specified. This is unlike in the standardised approach where E* is used directly to calculate risk-weighted assets by multiplying it with the counterparty risk weight.

Calculation of Adjusted Exposure (E) Using Comprehensive Approach*

3.106 Banking institutions must calculate an adjusted exposure amount after risk mitigation, E*. This is done by applying volatility adjustments to both the collateral and the exposure, taking into account possible future price fluctuations.

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

3.108 The formula is as follows:

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

where:

E*	=	The exposure value after risk mitigation
E	=	Current value of the exposure
H_E	=	Haircut appropriate to the exposure
C	=	The current value of the collateral received
H_C	=	Haircut appropriate to the collateral
H_{FX}	=	Haircut for currency mismatch between the collateral and exposure

3.109 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.

3.110 Partial collateralisation and mismatches in the maturity of the underlying exposure and the collateral is allowed under the comprehensive approach.

3.111 There are two approaches in determining the appropriate haircut to be applied on the exposure amount and collateral, namely:

- Standard supervisory haircuts; and
- VaR modelling, subject to the Bank's prior approval.

Please refer to paragraphs 2.119 to 2.128 and 2.133 to 2.137 for further details.

Treatment of Repo-style Transactions Covered Under Master Netting Agreement

3.112 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 in each relevant jurisdiction upon the occurrence of an event of default and regardless of whether the counterparty is insolvent or bankrupt. In addition, the netting agreement must:

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

3.113 In addition, all repo-style transactions should be subjected to the Global Master Repurchase Agreement (GMRA) with its relevant annexes that specify all terms of the transaction, duties and obligations between the parties concerned. Banking institutions must also ensure that other requirements specified under the Bank's current guidelines on repo-style transactions have also been met.

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

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

3.115 The following formula will apply to account for the impact of master netting agreements:

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

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 given security

H_S = Haircut appropriate to Es

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

H_{FX} = Haircut appropriate for currency mismatch

Calculation of LGD for Senior Claims Secured by Eligible Non-Financial Collateral

3.116 The LGD* for cases where banking institutions have taken eligible non-financial collateral to secure a corporate exposure is determined as follows:

i) The level of collateralisation of the exposure, C/E, must be calculated by dividing the current value of the collateral, C, to the current value of the exposure, E.

ii) Exposures where the level of collateralisation is below the required minimum collateralisation level of C* would receive the LGD of 45% for senior unsecured exposures.

iii) Where the level of collateralisation equals or exceeds the over-collateralisation level of C**, full LGD recognition can be applied to the exposure based on the following table:

LGD* for Secured Portion of Senior Exposures				
	Required Minimum Collateralisation Level (C*)	**LGD* if C/E < C***	**Required Minimum Over-collateralisation Level (C**)**	**LGD* if C/E ≥ C****
Receivables	0%	45%	125%	35%
CRE/RRE	30%		140%	35%
Other physical collateral (excludes physical assets acquired by the banking institution as result of borrower default)	30%		140%	40%

iv) Where the level of collateralisation is between the threshold levels C* and C**, the exposures are to be divided into fully collateralised and uncollateralised portions:

- The part of the exposure considered as fully collateralised, C/C**, receives the LGD associated with the type of collateral as per the above table;
- The remaining part of the exposure, 1-C/C**, is regarded as unsecured and receives an LGD of 45%[111].

Treatment for Pools of Collateral

3.117 The LGD* of a transaction where banking institutions have taken both eligible financial and non-financial collateral is based on the following:

i) Banking institutions must subdivide the adjusted value of the exposure (after haircut for eligible financial collateral) into portions each covered by only one CRM type. That is, banking institutions must divide the exposure into portions covered by the eligible financial collateral, receivables, CRE/RRE collateral and any other collateral and the unsecured portion, if any.

[111] For example, if an exposure of RM100 is covered by RM110 worth of CRE, only RM110/140 = RM78.6 is considered fully covered. The remaining exposure, RM100 – RM78.6 = RM21.4 is regarded as unsecured.

ii) Where the ratio of the sum of CRE/RRE value and other collateral to the reduced exposure (after recognising the eligible financial collateral and receivables collateral) is below the minimum level of collateralisation, the exposure would receive the unsecured LGD value of 45%.

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

III. Specific Requirements

Specific Requirements for Transactions Secured by Eligible Financial Collateral

3.118 In addition to the general requirements specified under paragraphs 3.95 and 3.96, the legal mechanism by which collateral is pledged or transferred must ensure that banking institutions have the right to liquidate or take legal possession of the collateral in a timely manner in the event of default, insolvency or bankruptcy of the counterparty. Furthermore, banking institutions must take all steps necessary to fulfil those requirements under the law to protect their interest in the collateral.

3.119 For collateral to provide effective cover, the credit quality of the counterparty and the value of collateral must not have a material positive correlation. For example, securities issued by the counterparty or a related counterparty[112] as a form of collateral against a loan would generally be materially correlated, thus providing little cover and therefore would not be recognised as eligible collateral.

3.120 Banking institutions must have clear and robust procedures for 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.

3.121 A capital requirement will be applied on either side of a collateralised transaction. For example, both repurchase and reverse repurchase agreements

[112] As defined under *Single Counterparty Exposure Limit*.

will be subject to capital requirements[113]. Likewise, both sides of securities lending and borrowing transactions will be subject to explicit capital charges, as will the posting of securities in connection with a derivative exposure or other borrowing.

3.122 Where a banking institution is 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 its obligations, then the risk to the banking institution is the same as if the banking institution had entered into the transaction as a principal. Under such circumstances, the banking institution will be required to allocate capital as if it were itself acting as the principal.

3.123 Where collateral is held by a custodian, banking institutions must take reasonable steps to ensure good custody of that collateral and take reasonable steps to ensure that the custodian segregates the collateral from its own assets.

Specific Requirements for Eligible CRE and RRE Collateral

3.124 Subject to meeting the definition above, CRE and RRE will be eligible for recognition as collateral only if the following operational requirements are met:

i) *Legal Enforceability*: Any claim on collateral taken must be legally enforceable in all relevant jurisdictions and any claim on collateral must be properly filed on a timely basis. Collateral interests must reflect a perfected charge[114] (i.e. the legal collateral agreement and the legal process underpinning it would enable banking institutions to realise the value of the collateral within a reasonable timeframe);

ii) *Objective Market Value of Collateral*: The collateral must be valued at or less *than* the current fair value under which the property could be sold

[113] Unlike repurchase and reverse repurchase agreements, sale and buy back agreements (SBBA) of securities are not deemed as collateralised transactions, hence a capital charge is required on the individual position for both parties according to the risk profile.

[114] Deeds of assignment and strata titles on the property are also recognised.

under private contract between a willing seller and an arm's-length buyer on the date of valuation;

iii) *Frequent Revaluation*: Banking institutions are expected to monitor the value of *collateral* at least once a year. More frequent monitoring may be appropriate where market conditions are subject to significant changes. Statistical methods of valuation (e.g. references to house price indices, sampling) may be used to update estimates or to identify collaterals that have declined in value and that require reappraisal. An engagement of a qualified professional might become necessary to evaluate property which value may have declined materially relative to general market prices or when a credit event, such as default, occurs; and

iv) *Recognition only for First Charge Collateral*: Subsequent charges can be recognised only if all earlier charges were made by the same banking institution. In instances where the subsequent charges are recognised, banking institutions must be able to demonstrate that such charges are enforceable and there have been precedent cases where the banking institution has been able to recoup the residual values.

3.125 Additional collateral management requirements are as follows:

i) The types of CRE and RRE collateral accepted and the lending policies (advance rates) when this type of collateral is taken must be clearly documented;

ii) The property taken as collateral is sufficiently insured against any deterioration and damages;

iii) The extent of any permissible prior claims (e.g. tax) on the property is assessed and monitored on an ongoing basis; and

iv) The risk of environmental liability arising in respect of the collateral, such as the presence of toxic material on a property is appropriately assessed and monitored.

Specific Requirements for Eligible Financial Receivables

3.126 Financial receivables will be eligible for recognition as collateral for corporate claims only if all of the following operational requirements are met:

Legal Certainty

i) The legal mechanism by which collateral is given must be robust and ensure that the banking institution has clear rights over the proceeds from the collateral;

ii) Banking institutions must take all steps necessary to fulfil local requirements in respect of the enforceability of security interest, e.g. by registering a security interest with a registrar. There should be a process to ensure the banking institution have a perfected first priority claim over the collateral;

iii) All documentation used in collateralised transactions must be binding on all parties and legally enforceable in all relevant jurisdictions. Banking institutions must conduct a legal review at the onset of the transaction and periodically to ensure the continuing enforceability of collaterals pledged to them; and

iv) The collateral arrangements must be properly documented with clearly written procedures on the timely collection of collateral proceeds. Banking institutions should ensure that any legal conditions required to declare a customer's default and timely collection of collateral are observed strictly. In the event of the borrower's financial distress or default, banking institutions should have the legal authority to sell or assign the receivables to other parties without the consent of the receivables' obligors.

Risk Management

i) Banking institutions must institute a sound process for determining the credit risk in receivables. Such process should include among other things, analyses of the borrower's business and industry (e.g. effects of the business cycle) and the types of customers with whom the borrower does business. Where banking institutions rely on the borrower to ascertain the credit risk of the borrowers' customers, banking institutions must review and assess the borrower's credit policy to ascertain its soundness and credibility;

ii) The margin between the amount of the exposure and the value of the receivables must incorporate relevant factors such as the cost of collection, concentration within the receivables pool pledged by an individual borrower and potential concentration risk within banking institutions' total exposures;

iii) In ensuring ongoing appropriateness of the collateral as a risk mitigant, banking institutions must maintain a continuous monitoring process that is commensurate with the specific exposures (either immediate or contingent) attributable to the collateral to be utilised as a risk mitigant. This process may include, where appropriate and relevant, ageing reports, control of trade documents, borrowing base certificates, frequent audits of collateral, confirmation of accounts, control of the proceeds of accounts paid, analysis of dilution (credits given by the borrower to the receivables obligors) and regular financial analysis of both the borrower and the receivables obligors, especially in the case when a small number of large sized receivables are taken as collateral. Overall concentration limits should be monitored strictly by banking institutions. Additionally, any compliance with loan covenants, environmental restrictions and other legal requirements should be monitored on a regular basis;

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

v) Banking institutions should document the process relating to collecting receivable payments in distressed situations. The necessary processes for collection should be in place, even when banking institutions normally look to the borrower for collections.

Specific Requirements for Recognition of Other Eligible Physical Collateral

3.127 The Bank may allow other physical collateral to be recognised as a credit risk mitigant provided that the banking institution can demonstrate to the Bank that such physical collateral meets the following standards:

i) Existence of liquid markets for disposal of collateral in an expeditious and economically efficient manner;

ii) Existence of well established, publicly available market prices for the collateral; and

iii) The amount banking institutions receive when collateral is realised does not deviate significantly from market prices.

In addition, the requirements in paragraphs 3.124 and 3.125 must be met, subject to the following modification:

iv) Banking institutions must have priority of claims over all other lenders to the realised proceeds of the collateral. Only first charges over the collateral are permissible;

v) The loan agreement must include detailed descriptions of the collateral plus detailed specifications of the manner and frequency of revaluation;

vi) The types of physical collateral accepted by banking institutions and policies and practices in respect of the appropriate amount of each type of collateral relative to the exposure amount must be clearly documented in internal credit policies and procedures and available for examination by the Bank and/or audit review;

vii) Banking institutions' credit policies must contain appropriate collateral requirements. This includes requirements on the exposure amount, the ability for timely liquidation of the collateral, determining market value (including the frequency of revaluation) and volatility of the market value. The periodic revaluation process must pay particular attention to collaterals whose values depend on the current trend in the market (i.e. fashion sensitive collaterals). This is to ensure that valuations are appropriately adjusted downward for model year, obsolescence or deterioration; and

viii) In cases of inventories (e.g. raw material, finished goods, dealers' inventories of autos) and equipment, the periodic revaluation process must include physical inspection of the collateral.

Guarantees and Credit Derivatives

I. Eligible Guarantors/Credit Protection Providers

3.128 The range of eligible guarantors/credit protection providers are the same as those under the standardised approach. In addition, companies that are internally rated and associated with a PD equivalent to BBB-[115] rating or better, may also be recognised under the foundation approach. The requirements outlined in paragraphs 3.139 to 3.142 must also be met to qualify for this recognition.

3.129 For credit derivatives, only credit default swaps and total return swaps that provide credit protection which is equivalent to a guarantee are eligible for recognition. No recognition is given where banking institutions buy credit protection through a total return swap and record the net payments received on the swap as net income, but does not record offsetting deterioration in the value of the asset that is protected (either through reductions in fair value or by an addition to reserve).

[115] This may be done by mapping the internal rating and associated PD of the protection provider to the banking institution's PD masterscale to ascertain that it approximates a rating of BBB- or better by an eligible ECAI.

II. Methodology

The Substitution Method

3.130 Under the substitution method, guarantees and credit derivatives will be recognised as follows:

i) Risk weight for the covered portion of the exposure is derived by using:

- The risk weight function appropriate to the type of guarantor, and
- The PD appropriate to the guarantor's borrower grade, or some grade between the underlying obligor and the guarantor's borrower grade if the banking institution deems a full substitution treatment is not warranted.

ii) The LGD of the underlying transaction may be replaced with the LGD applicable to the guarantee taking into account seniority and any collateralisation of a guaranteed commitment.

3.131 The uncovered portion of the exposure is assigned the risk weight associated with the borrower.

3.132 CRM from guarantees and credit derivatives must not reflect the effect of double default[116]. To the extent that the CRM is recognised, the adjusted risk weight must not be less than a comparable direct exposure to the protection provider.

3.133 Any amount for which the banking institution will not be compensated for in the event of loss, shall be recognised as retained first loss positions and risk-weighted at 1250% by the banking institution purchasing the credit protection.

3.134 Where partial coverage exists, or where there is a currency mismatch between the underlying obligation and the credit protection, the exposure must be split into covered and uncovered amount. The treatment is outlined below:

[116] Refer to footnote 102.

Proportional Cover

- Where the amount guaranteed, or against which credit protection is held, is less than the amount of the exposure, and the secured and unsecured portions are equal in seniority, i.e. the banking institution and guarantor share losses on a pro-rata basis, capital relief will be accorded on a proportional basis with the remainder being treated as unsecured.

Tranched Cover

- Where:
  - a banking institution transfers a portion of the risk of an exposure in one or more tranches to a protection seller(s) and retains some level of risk of the exposure; and
  - the portion of risk transferred and retained are of different seniority, the banking institution 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 the securitisation component of this framework will apply.

Currency Mismatches

- A haircut, H_{FX}, shall be applied on the exposure protected if its credit protection is denominated in a different currency, as follows:

$$GA = G \times (1 - H_{FX})$$

where:

G = Nominal amount of the credit protection

H_{FX} = Haircut appropriate for currency mismatch between the credit protection and underlying obligation. The supervisory haircut is 8%. The haircut 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 2.123**.**

3.135 For exposures where the borrower is part of a portfolio on the IRB approach while the guarantor or credit protection provider is part of a portfolio which is not

under the IRB approach (i.e. standardised approach)[117], banking institutions must ensure that these borrowers also fulfill the expectations under the IRB approach (e.g. annually reviewed etc.) on an ongoing basis. The appropriate treatment based on the standardised approach shall be applied to the guaranteed/protected portion of the exposure.

The Double Default Method

3.136 Banking institutions also can apply the double default method instead of the substitution method where exposures are hedged by the following eligible instruments:

i) Single-name, unfunded credit derivatives (e.g. credit default swaps) or single-name guarantees.

ii) First-to-default basket products — the double default treatment will be applied to the asset within the basket with the lowest risk-weighted amount.

iii) Nth-to-default basket products — the protection obtained is only eligible for consideration under the double default framework if eligible $(n–1)^{th}$ default protection has also been obtained or where (n–1) of the assets within the basket have already defaulted.

3.137 The entity providing the above instruments must be a banking institution[118] or an insurance company (but only those that are in the business of providing credit protection, including mono-lines, professional re-insurers, and non-sovereign credit export agencies[119]) that:

i) is regulated in a manner broadly equivalent to this framework (where there is appropriate supervisory oversight and transparency/market discipline), or externally rated as at least investment grade by an approved ECAI for purposes of the capital framework;

[117] For example, a loan granted to a corporate (under the IRB approach) is guaranteed by a banking institution (under the standardised approach).

[118] This does not include PSEs and MDBs, even though claims on these may be treated as claims on banks according to **Part B.3.2**.

[119] By non-sovereign it is meant that the credit protection in question does not benefit from any explicit sovereign counter-guarantee.

ii) had an internal rating with a PD equivalent to or lower than that associated with an external BBB- rating at the time the credit protection for an exposure was first provided; and

iii) continues to maintain an internal rating with a PD equivalent to or lower than that associated with an external BBB- rating.

3.138 Banking institutions using the double default method for the hedged exposure would apply the risk weight formula described under paragraphs 3.170 to 3.171 in determining the capital requirement.

III. Specific Requirements

Specific Requirements Common for Guarantees and Credit Derivatives

3.139 For a guarantee or credit derivative to be eligible for CRM, the following conditions must be met:

i) The guarantee or credit derivative 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 could not be disputed;

ii) The credit protection contract must be irrevocable except where the credit protection purchaser has not made the payment due to the protection provider. The protection provider must also not have the right to unilaterally cancel the credit cover or increase the effective cost of cover as a result of deteriorating credit quality in the hedged exposure;

iii) The contract must not have any clause or provision outside the direct control of the banking institution that prevents the protection provider from being obliged to pay in a timely manner in the event that the original counterparty fails to make the payment(s) due. However, for advanced IRB exposures, conditional guarantees may also be recognised as eligible CRM as per paragraph 3.342; and

iv) Additional operational requirements specific for guarantees and credit derivatives specified in paragraphs 3.140 to 3.142 must be met.

Additional Specific Requirements for Guarantees

3.140 In addition to the requirements on legal certainty of the guarantee specified in paragraph 3.95 and 3.96, all the following conditions must also be satisfied:

i) On the default/non-payment of the counterparty, a banking institution may in a timely manner pursue the guarantor for any monies outstanding under the documentation governing the transaction. The guarantor may pay at once all monies outstanding under such documentation to the banking institution, or the guarantor may assume the future payment obligations of the counterparty covered by the guarantee;

ii) The guarantee undertaking is explicitly documented; and

iii) Except as noted in the following sentence, the guarantee covers all types of payments the borrower is expected to make under the documentation governing the transaction, such as notional amount and margin payments. Where a guarantee covers payment of principal only, interests and other uncovered payments should be treated as unsecured amounts in line with the treatment for proportionally covered exposures under paragraph 3.134.

3.140(i) Banking institutions shall only recognise trade credit insurance or trade credit takaful as CRM when the requirements under paragraphs 2.144(i), 2.148(i), 2.148(ii), 3.94, 3.95, 3.96, 3.139 and 3.140 are satisfied.

Additional Specific Requirement for Credit Derivatives

3.141 For a credit derivative contract to be recognised, the following conditions must be satisfied:

i) Credit events specified by the contracting parties must at least cover:

- Failure to pay the amounts due under terms of the underlying obligation on the occurrence of a credit event;
- Bankruptcy, insolvency and inability of the borrower to pay its debts, or its failure or admission in writing of its inability generally to pay its debts as they become due, and analogous events; and
- Restructuring of the underlying obligation involving forgiveness or postponement of principal, interest or fees that results in a credit loss

event (i.e. charge off, provision or other similar debit to the profit and loss account). However, when restructuring is not specified as a credit event but the other requirements in this paragraph are met, partial recognition of the credit derivatives will be allowed as follows:

- If the amount of credit derivatives is less than or equal to the amount of underlying obligation, 60% of the amount of the hedging instrument can be recognised as covered.
- If the amount of the credit derivative is larger than that of the underlying obligation, then the amount of eligible hedge is capped at 60% of the amount of the underlying obligation.

ii) The credit derivatives shall not be terminated prior to expiration of any grace period required for a default on the underlying obligation to occur as a result of a failure to pay, subject to the provision of paragraph 3.156;

iii) Credit derivatives allowing for cash settlement are recognised for capital purpose as long as a robust valuation process is in place to estimate loss reliably. There must be a clearly specified period for obtaining post-credit-event valuation of the underlying obligation;

iv) If the contract requires the protection purchaser to transfer the underlying obligation to the protection provider at settlement, the terms of the underlying obligation must provide that consent to such transfer should not be unreasonably withheld;

v) The identity of the parties responsible to determine whether a credit event has occurred must be clearly defined. This determination must not be the sole responsibility of the protection seller. The protection buyer must have the right/ability to inform the protection provider of the occurrence of a credit event;

vi) If the credit derivatives cover obligations that do not include the underlying obligation, a mismatch between the underlying and the reference obligation for the credit derivative (i.e. the obligation used for purposes of determining cash settlement value of the deliverable obligation) is permissible if:

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

vii) A mismatch between the underlying obligation and the obligation used for purposes of determining whether a credit event has occurred is permissible if:

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

3.142 Banking institutions also have to demonstrate to the Bank that any additional requirements outlined in the Bank's current guidelines are met[120].

Additional Requirements for Recognition of Double Default

3.143 For each eligible exposure, banking institutions need to determine whether the double default or the substitution method is to be applied.

3.144 In addition to the conditions specified in paragraphs 3.136 and 3.137, the double default method is only applicable if the following conditions have also been met.

i) The risk weight that is associated with the exposure prior to the application of the double default treatment does not already factor in any aspect of the credit protection.

ii) The underlying obligation is:

- a corporate exposure as defined in paragraphs 3.24 to 3.27 (excluding SL exposures for which the SSC approach described in paragraphs 3.166 to 3.169 is being used); or

[120] [Deleted]

- a claim on a PSE that is not a sovereign exposure as defined in paragraph 3.28; or
- a loan extended to a small business and classified as a retail exposure as defined in paragraph 3.30.

iii) The borrower is not:

- a financial firm as defined in paragraph 3.137; or
- a member of the same group as the protection provider.

iv) Credit protection meets the minimum operational requirements for such instruments as outlined in paragraphs 3.129 and 3.139 to 3.142.

v) Consistent with paragraph 3.140 for any recognition of double default that affects both guarantees and credit derivatives, banking institutions must have the right and expectation to receive payment from the credit protection provider without having to take legal action to pursue the counterparty for payment. If a credit event should occur, steps should be taken to ensure that the protection provider is willing to pay promptly.

vi) The purchased credit protection absorbs all credit losses incurred on the hedged portion of an exposure that arises due to credit events outlined in the contract.

vii) If the payout structure provides for physical settlement, then there must be legal certainty with respect to the deliverability of a loan, bond, or contingent liability. If a 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 would have the ability to purchase it for delivery in accordance with the contract.

viii) The terms and conditions of credit protection arrangements must be legally confirmed in writing by both the credit protection provider and the banking institution.

ix) In the case of protection against dilution risk, the seller of purchased receivables must not be a member of the same group as the protection provider.

x) There is no excessive correlation between the creditworthiness of a protection provider and the borrower of the underlying exposure due to performance being dependent on common factors beyond the systematic

risk factor. Banking institutions should establish a mechanism to detect the existence of such excessive correlation. An example of excessive correlation is where a protection provider guarantees the debt of a supplier of goods or services and the supplier derives a high proportion of its income or revenue from the protection provider.

On-Balance Sheet Netting[121]

I. Specific Requirements for On-Balance Sheet Netting

3.145 Banking institutions are allowed to compute credit exposures on a net basis for capital requirements where banking institutions have legally enforceable netting arrangements for loans and deposits[122]. In addition, banking institutions can only apply on-balance sheet netting on any exposure if the following conditions have been met:

i) Strong legal basis that the netting or off-setting agreement is enforceable in each relevant jurisdiction regardless of whether the counterparty is in default, insolvent or bankrupt;

ii) Able to determine at any time the assets and liabilities of the counterparty that are subject to the netting agreement;

iii) Monitors and controls roll-off risks123; and

iv) Monitors and controls the relevant exposure on a net basis.

II. Methodology

3.146 The computation of the net exposure to a counterparty for capital adequacy computation purposes is similar to that specified for collateralised transactions under paragraph 3.108, where assets (loans) are treated as exposures and liabilities (deposits) as collateral. For on-balance sheet netting, the haircut will be zero except where there is a currency mismatch. A 10-business day holding period will apply when daily mark-to-market is conducted and all the

[121] As opposed to other CRM techniques that mostly affect the LGD component, the effects of on-balance sheet netting are incorporated in the EAD component.

[122] Structured deposits and Restricted Investment Account would not be recognised for on-balance sheet netting.

[123] Roll-off risks relate to the sudden increases in exposure which can happen when short dated obligations used to net long dated claims mature.

requirements contained in paragraphs 3.155 to 3.158 and paragraphs 2.119 to 2.124 will apply.

3.147 For the purpose of calculating RWA for the exposure following the on-balance sheet netting, the relevant PD and LGD or risk weight for the counterparty and transaction shall be applied to the net exposure amount. .

Other Aspects of Credit Risk Mitigation

Treatment of Pools of Credit Risk Mitigation Techniques

3.148 When multiple credit risk mitigation techniques are used to cover a single exposure, the exposure should be divided into portions which are covered by each type of credit risk mitigation technique. The risk-weighted assets of each portion must be calculated separately. Where credit protection provided by a single guarantor has different maturities, these must also be divided into separate portions.

3.149 In addition, where a single transaction is attached to multiple forms of credit risk mitigants, banking institutions are able to obtain the largest capital relief possible from the risk mitigants.

First to Default Credit Derivatives

3.150 There are cases where a banking institution obtains protection for a basket of reference names and where the first default among the reference names triggers the credit protection and the credit event also terminates the contract.

3.151 In this case, a banking institution may recognise regulatory capital relief for the asset within the basket with the lowest risk-weighted amount, but only if the notional amount is less than or equal to the notional amount of the credit derivative.

3.152 With regard to a banking institution providing credit protection through such an instrument, the risk-weighted asset as specified under the securitisation component of the Revised Capital Framework will be applied.

Second to Default Credit Derivatives

3.153 In the case where the second default among the assets within the basket triggers the credit protection, the banking institution obtaining credit protection through such a product will only be able to recognise any capital relief if first default protection has also been obtained or when one of the assets within the basket has already defaulted.

3.154 For banking institutions providing credit protection through such a product, the capital treatment is the same as paragraph 3.151 with the exception that, in aggregating the risk-weighted assets amount, the asset with the lowest risk-weighted amount can be excluded from the calculation.

Maturity Mismatches

3.155 For calculating RWA, a maturity mismatch occurs when the residual maturity of a hedge is less than that of the underlying exposure.

Definition of Maturity

3.156 The maturity of the underlying exposure and the maturity of the hedge should both be defined conservatively. The M of the underlying should be gauged as the longest possible remaining time before the counterparty is scheduled to fulfil its obligation, taking into account any applicable grace period. For a hedge, embedded options which may reduce the term of the hedge should be taken into account so that the shortest possible M 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 banking institution but the terms of the arrangement at origination of the hedge contain a positive incentive for the banking institution to call the transaction before contractual maturity, the remaining time to the first call date will be deemed to be the M. 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 M will be the remaining time to the first call.

Risk Weights for Maturity Mismatches

3.157 Hedges with maturity mismatches are only recognised when the 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 the residual maturity of the hedge is three months or less.

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

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

where:

P_a = Value of the credit protection adjusted for maturity mismatch

P = Credit protection (e.g. collateral amount, guarantee amount) adjusted for any haircuts

t = Min (T, residual maturity of the credit protection arrangement) expressed in years

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

B.3.5 RISK-WEIGHTED ASSETS

Risk-Weighted Assets for Corporate, Sovereign and Bank Exposures

I. Formula for Derivation of Risk-Weighted Assets

3.159 The derivation of RWA is dependent on estimates of the PD, LGD, EAD and, M for a given exposure.

3.160 The computation of RWA for exposures not in default, is[124]:

Capital requirement[125] (K) =

$$\left[LGD \cdot N\left[\frac{1}{\sqrt{1-R}} \cdot N^{-1}(PD) + \sqrt{\frac{R}{1-R}} \cdot N^{-1}(0.999)\right] - PD \cdot LGD\right] \cdot \left[\frac{1+(M-2.5)b}{1-1.5b}\right]$$

RWA = K x 12.5 x EAD

where:

Maturity adjustment, b $= [0.11852 - 0.05478 \cdot \ln(PD)]^2$

Correlation, R = $0.12\left[\frac{1-EXP(-50 \cdot PD)}{1-EXP(-50)}\right] + 0.24\left[1 - \frac{1-EXP(-50 \cdot PD)}{1-EXP(-50)}\right]$

Illustrative IRB risk weights are shown in **Appendix XXVII**.

3.161 The formula above and the requirement for foundation IRB banking institutions to establish its own PD estimates[126] for all borrowers within their corporate portfolio shall also apply to corporate exposures guaranteed by the Credit Guarantee Corporation (CGC). However, the effective risk weight for corporate exposures guaranteed by the CGC which are not in default, shall be capped at 20%[127].

---

[124] Ln denotes the natural logarithm. 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). $N^{-1}(z)$ denotes the inverse cumulative distribution function for a standard normal random variable (i.e. the value of x such that N(x) = z). The normal cumulative distribution function and the inverse of the normal cumulative distribution function are, for example, available in Excel as the functions NORMSDIST and NORMSINV. EXP denotes the exponential function.

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

[126] Advanced IRB banking institutions would also have to estimate LGD and EAD.

[127] Only applicable on the guaranteed portion of the exposures.

3.162 The capital requirement (K) for a defaulted exposure is the greater of:

i) zero, and

ii) the difference between its LGD (described in paragraph 3.322) and the banking institution's best estimate of expected loss (described in paragraph 3.326).

The RWA amount for the defaulted exposure is the product of K, 12.5, and EAD.

3.163 Banking institutions that meet the requirements for the estimation of PD for SL exposures may use the formula in paragraph 3.160 to derive the risk-weighted assets, except for HVCRE where the following asset correlation formula will apply:

$$\text{Correlation (R)} = 0.12\left[\frac{1-EXP(-50\cdot PD)}{1-EXP(-50)}\right]+0.30\left[1-\left(\frac{1-EXP(-50\cdot PD)}{1-EXP(-50)}\right)\right]$$

Banking institutions that do not meet the requirements for the estimation of PD for SL exposures are required to use the SSC approach from paragraphs 3.166 to 3.169.

II. Firm-size Adjustment for Small and Medium-sized Corporates

3.164 Banking institutions may separately distinguish exposures to small and medium-sized corporates[128] from those to large corporates. A firm-size adjustment (S) is made to the asset correlation formula. S is expressed as total annual sales in RM millions with values of S falling between RM25 million to RM250 million. Reported sales of less than RM25 million will be treated as equal to RM25 million for the purpose of this paragraph.

$$\text{Correlation (R)} = 0.12\left[\frac{1-\text{EXP}(-50\cdot\text{PD})}{1-\text{EXP}(-50)}\right]+0.24\left[1-\frac{1-\text{EXP}(-50\cdot\text{PD})}{1-\text{EXP}(-50)}\right]-0.04\left(1-\frac{S-25}{225}\right)$$

[128] Defined as corporate exposures where the reported sales for the consolidated group of which the firm is a part is less than RM250 million.

3.165 When total sales is not a meaningful indicator of a firm's size, the Bank may allow banking institutions to use total assets of the consolidated group as a basis to calculate the small and medium-sized corporate threshold and the firm-size adjustment.

III. Risk Weights for Sub-classes of SL - PF, OF, CF, IPRE and HVCRE

3.166 For banking institutions adopting the SSC approach[129] for their SL portfolio, banking institutions should map the internal grades to five supervisory categories based on the slotting criteria provided in **Appendix VII(a)**.

3.167 The risk weights associated with each supervisory category for PF, OF, CF and IPRE are:

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

3.168 Banking institutions may apply preferential risk weights of 50% to "strong" exposures, and 70% to "good" exposures as per the table below, subject to meeting either of the following conditions:

- Remaining maturity of the current SL exposure is less than 2.5 years; or
- Project construction is completed.

Strong	Good	Satisfactory	Weak	Default
50%	70%	115%	250%	0%

3.169 The risk weights for HVCRE exposures associated with each supervisory category are:

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

[129] Banking institutions that meet the requirements for the estimation of PD will be able to use the general foundation approach for the corporate asset class to derive risk weights for SL sub-classes. Banking institutions that meet the requirements for the estimation of PD and LGD and/or EAD will be able to use the general advanced approach for the corporate asset class to derive risk weights for SL sub-classes.

IV. Risk-Weighted Assets for Exposures subject to the Double Default Framework

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

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

K_0 is calculated in the same way as a capital requirement for an unhedged corporate exposure (as defined in paragraph 3.160 to 3.162 and 3.164), but using different parameters for LGD and the maturity adjustment.

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

PD_o and PD_g are the probabilities of default of the obligor and guarantor, respectively, both subject to the PD floor set out in paragraph 3.47. The correlation ρ_{os} is calculated according to the formula for correlation (R) in paragraph 3.160 or 3.164, with PD being equal to PD_o, and LGD_g is the LGD of a comparable direct exposure to the guarantor[130]. There shall be no consideration of double recovery in the LGD estimate[131]. The maturity adjustment coefficient, b, is calculated according to the formula for maturity adjustment in paragraph 3.160, with PD being the lower of PD_o and PD_g. M is the effective maturity of the credit protection, which must not be below the one-year floor if the double default framework is to be applied.

[130] Consistent with paragraph 3.132, the LGD associated with an unhedged facility to the guarantor or the unhedged facility to the obligor, depending upon whether, in the event both the guarantor and the obligor default during the life of the hedged transaction, available evidence and the structure of the guarantee indicate that the amount recovered would depend on the financial condition of the guarantor or obligor, respectively; in estimating either of these LGDs, a banking institution may recognise collateral posted exclusively against the exposure or credit protection, respectively, in a manner consistent with paragraph 3.130, 3.166, 3.322 to 3.326, 3.330 and 3.331, as applicable.

[131] Only recoveries from the guarantor are taken into consideration and no recognition is given for recoveries from obligor.

3.171 The RWA amount is calculated in the same way as for unhedged exposures, as follows:

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

Risk-Weighted Assets for Retail Exposures

3.172 There are three separate risk weight functions for retail exposures as defined below. Risk weights for retail exposures are based on separate assessments of PD and LGD as inputs to the risk weight functions. None of the three retail risk weight functions contain an explicit maturity adjustment. Illustrative risk weights are shown in **Appendix XXVII**.

I. Exposures Secured by Residential Properties

3.173 For exposures defined in paragraph 3.34 that are not in default and are secured or partly secured[132] by residential mortgages, risk weights will be assigned based on the following formula:

Correlation (R) = 0.15

Capital requirement (K) =

$$LGD \cdot N\left[\frac{1}{\sqrt{1-R}} \cdot N^{-1}(PD) + \sqrt{\frac{R}{1-R}} \cdot N^{-1}(0.999)\right] - PD \cdot LGD$$

RWA = K x 12.5 x EAD

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

II. Qualifying Revolving Retail Exposures

3.174 For QRRE as defined in paragraph 3.35 that are not in default, risk weights are defined based on the following formula:

Correlation (R) = 0.04

Capital requirement (K) =

$$LGD \cdot N\left[\frac{1}{\sqrt{1-R}} \cdot N^{-1}(PD) + \sqrt{\frac{R}{1-R}} \cdot N^{-1}(0.999)\right] - PD \cdot LGD$$

RWA = K x 12.5 x EAD

III. Other Retail Exposures

3.175 For all other retail exposures that are not in default, risk weights are defined based on the following formula, which allows correlation to vary with PD:

Correlation (R) = $0.03\left[\frac{1-EXP(-35 \cdot PD)}{1-EXP(-35)}\right] + 0.16\left[1-\frac{1-EXP(-35 \cdot PD)}{1-EXP(-35)}\right]$

Capital requirement (K) =

$$LGD \cdot N\left[\frac{1}{\sqrt{1-R}} \cdot N^{-1}(PD) + \sqrt{\frac{R}{1-R}} \cdot N^{-1}(0.999)\right] - PD \cdot LGD$$

RWA = K x 12.5 x EAD

3.176 The formulas above and the requirement to establish PD, LGD and EAD estimates shall also apply to priority sector residential mortgages and any retail exposures guaranteed by CGC. However, the effective risk weight for:

i) Priority sector residential mortgages, which are not in default, shall be capped at 50%. However, the effective risk weight cap for any loans with a loan-to-value ratio of more than 90% approved and disbursed by banking institutions on or after 1 February 2011 is 75%; and

ii) Any retail exposures guaranteed by CGC, which are not in default, shall be capped at 20%[133].

[133] Only applicable on guaranteed portion of the exposures.

3.177 The capital requirement (K) for a defaulted exposure (for all three types of retail exposures) is equal to the greater of :

i) zero; and

ii) the difference between its LGD and the banking institution's best estimate of expected loss.

The RWA amount for the defaulted exposure is the product of K, 12.5, and EAD.

Risk-Weighted Assets for Equity Exposures

3.178 There are two approaches to calculate RWA for equity exposures held in the banking book:

i) Market-based approach (which is subdivided into the simple risk weight method and the internal models method); and

ii) PD/LGD approach.

Certain equity holdings as defined in paragraphs 3.194 to 3.196 are excluded from these approaches.

3.179 Banking institutions' choices must be applied consistently and not determined by regulatory arbitrage considerations. The method used should be consistent with the amount and complexity of the banking institution's equity holdings and commensurate with the overall size and sophistication of the institution.

3.180 Notwithstanding the above, the Bank may require a banking institution to employ the PD/LGD or the internal models approach instead of the simple risk weight approach if equity exposures constitute a significant part of its business.

I. Market-Based Approach

3.181 Under the market-based approach, banking institutions are permitted to use one or both of the methods below.

Simple Risk Weight Method

3.182 Under the simple risk weight method, a 300% risk weight is applied to equity holdings that are publicly traded and a 400% risk weight to all other equity holdings. A publicly traded holding is defined as any equity security traded on a recognised securities exchange (please refer to **Appendix X**).

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

Internal Models Method

3.184 Banking institutions may use, or may be required by the Bank to use, internal risk measurement models to calculate the capital requirement, subject to the minimum requirements set out in **Part B.3.7** of this framework. Under this method, banking institutions must hold capital equal to the potential loss on equity holdings as derived using internal value-at-risk (VaR) models subject to the 99th percentile, one-tailed confidence interval of the difference between quarterly returns and an appropriate risk-free rate computed over a long-term[134] sample period. The capital charge would be incorporated into banking institutions' capital adequacy computation.

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

[134] The Bank would expect banking institutions to have data covering at least five years or 20 data points of quarterly returns.

3.186 Capital charges calculated under the internal models method should not be less than the capital charges that would be calculated under the simple risk weight method using a 200% risk weight for publicly traded equity holdings and a 300% risk weight for all other equity holdings. Further, these minimum risk weights are to apply at the individual exposure level rather than at the portfolio level.

3.187 Subject to approval by the Bank, banking institutions may be allowed to use different market-based approaches to different portfolios if they are already adopting these approaches internally, subject to proper justifications.

3.188 Banking institutions adopting the market-based approach for equity exposures are permitted to recognise guarantees but not the collateral obtained on that equity exposure.

II. PD/LGD Approach

3.189 Banking institutions wishing to adopt the PD/LGD approach to calculate the equivalent credit risk-weighted assets of equity exposures (including equity of companies that are included in the retail asset class) are required to fulfil the minimum requirements and methodology for the IRB foundation approach[135] for corporate exposures, subject to the following specifications:

i) The banking institution's estimate of the PD of a corporate entity in which it holds an equity position must satisfy the same requirements as its estimate of the PD of a corporate entity where it holds debt[136], except in the following instances:

- Where a banking institution does not hold a debt in the company in which it holds equity, and does not have sufficient information on the position of that company to be able to use the applicable definition of default in practice but meets the other minimum requirements, a 1.5 scaling factor will be applied to the risk weights derived from the

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

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

corporate risk weight function, given the PD set by the banking institution.

- If, however, the banking institution's equity holdings are material[137] and it is permitted to use the PD/LGD approach for regulatory purposes but the banking institution has not yet met the relevant standards, the simple risk weight method under the market-based approach will apply.

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

iii) The risk weight is subject to a five-year maturity adjustment whether or not the banking institution is using the explicit approach to maturity elsewhere in its IRB portfolio.

3.190 Under the PD/LGD approach, minimum risk weights as set out in paragraphs 3.191 and 3.192 apply. When the sum of UL and EL associated with the equity exposure results in less capital than would be required from application of one of the minimum risk weights, the minimum risk weights must be used. In other words, the minimum risk weights must be applied, if the risk weights calculated according to paragraph 3.189 plus the EL associated with the equity exposure multiplied by 12.5 are smaller than the applicable minimum risk weights.

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

- Public equities where the investment is part of a long-term customer-banker relationship and no capital gains are expected to be realised in the short term and where there is no anticipation of (above trend) capital gains in the long term. It is expected that in almost all cases, the banking institution will have lending and/or general banking relationships with the portfolio company so that the estimated PD is readily available. In general, the banking institution is expected to hold the equity over a long term period (at least five years).

[137] Materiality threshold is defined similar to materiality threshold used to determine equity holdings that are exempted from the IRB scope.

- Private equities, where the returns on the investment are based on regular and periodic cash flows not derived from capital gains and there is no expectation of future (above trend) capital gain or of realising existing gain.

3.192 For all other equity positions, including net short positions (as defined in paragraph 3.183), capital charges calculated under the PD/LGD approach may be no less than the capital charges that would be calculated under a simple risk weight method using a 200% risk weight for publicly traded equity holdings and a 300% risk weight for all other equity holdings.

3.193 The maximum risk weight for the PD/LGD approach for equity exposures is 1250%. This maximum risk weight can be applied, if risk weights calculated according to paragraph 3.189 plus the EL associated with the equity exposure multiplied by 12.5 exceed the 1250% risk weight.

III. Exclusions to the Market-Based and PD/LGD Approaches

3.194 Equity holdings in entities whose debt obligations qualify for a 0% risk weight under the standardised approach can be excluded from the IRB approaches for equities. These equity exposures will attract a risk weight of 20%.

3.195 Equity investments called for by the Federal Government of Malaysia, Bank Negara Malaysia, Association of Banks in Malaysia, Association of Islamic Banking Institutions in Malaysia, or Malaysian Investment Banking Association shall receive a risk weight of 100% (subject to a cap of 10% of the banking institution's Total Capital).

3.196 Investments in the ABF Malaysia Bond Index Fund and investments in equity of non-financial commercial subsidiaries will apply the same treatment as per paragraph 2.44.

Risk-Weighted Assets for Purchased Receivables

Default Risk

3.197 For receivables categorised under one asset class, the IRB risk weight for default risk is based on the risk weight function applicable to that particular exposure type, as long as a banking institution can meet the qualification standards for this particular risk weight function. For example, if a banking institution cannot comply with the standards for QRRE, it should use the risk weight function for other retail exposures.

3.198 For hybrid pools containing mixtures of exposure types, if the purchasing banking institution cannot separate the exposures by type, the risk weight function producing the highest capital requirements for the exposure types in the receivable pool applies.

I. Purchased Retail Receivables

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

II. Purchased Corporate Receivables

3.200 For purchased corporate receivables, the purchasing banking institution is expected to apply the existing IRB risk quantification standards for the bottom-up approach. However, for eligible purchased corporate receivables, and subject to the Bank's approval, banking institutions may employ the following top-down procedure to calculate the IRB risk weights for default risk:

- The purchasing banking institution will estimate the pool's one-year EL for default risk, expressed in percentage of the exposure amount (i.e. the total EAD amount to the banking institution by all receivables obligors in the receivables pool). The estimated EL on the receivables should be calculated on a stand-alone basis without any assumption of recourse or guarantees

from the seller or other parties. The treatment of recourse or guarantees covering default risk (and/or dilution risk) is elaborated separately below.

- Given the EL estimate for the pool's default losses, the risk weight for default risk is determined by the risk weight function for corporate exposures[138]. As described below, the precise calculation of risk weights for default risk depends on the banking institution's ability to decompose EL into its PD and LGD components in a reliable manner. Banking institutions can utilise external and internal data to estimate PDs and LGDs. However, the advanced approach cannot be adopted by banking institutions that use the foundation approach for corporate exposures.

Foundation IRB treatment

3.201 If the purchasing banking institution is unable to decompose EL into its PD and LGD components in a reliable manner, the risk weight is determined from the corporate risk weight function using the following specifications:

- If banking institution can demonstrate that the exposures are exclusively senior claims to corporate borrowers, an LGD of 45% can be used. PD will be calculated by dividing the EL using this LGD. EAD will be calculated as the outstanding amount minus the capital charge for dilution prior to credit risk mitigation ($K_{Dilution}$).
- Otherwise, PD is the banking institution's estimate of EL; LGD will be 100%; and EAD is the amount outstanding minus $K_{Dilution}$.
- EAD for a revolving purchase facility is the sum of the current amount of receivables purchased plus 75% of any undrawn purchase commitments minus $K_{Dilution}$.
- If the purchasing banking institution is able to estimate PD in a reliable manner, the risk weight is determined from the corporate risk weight functions according to the specifications for LGD and M under the foundation approach as given in paragraphs 3.49 to 3.55 and 3.66.

[138] The firm-size adjustment for small and medium-sized corporates will be the weighted average by individual exposure of the pool of purchased corporate receivables. If the banking institution does not have the information to calculate the average size of the pool, the firm-size adjustment will not apply.

Advanced IRB treatment

3.202 If the purchasing banking institution can estimate either the pool's default-weighted average loss rates given default (as defined in paragraph 3.322) or average PD in a reliable manner, banking institution may estimate the other parameter based on an estimate of the expected long-run loss rate as follows:

i) using an appropriate PD estimate to infer the long-run default-weighted average loss rate given default, or

ii) using a long-run default-weighted average loss rate given default to infer the appropriate PD.

In either case, it is important to recognise that the LGD used for the IRB capital calculation for purchased receivables cannot be less than the long-run default-weighted average loss rate given default and must be consistent with the concepts defined in paragraph 3.322. The risk weight for the purchased receivables will be determined using the banking institution's estimated PD and LGD as inputs to the corporate risk weight function. Similar to the foundation IRB treatment, EAD will be the amount outstanding minus $K_{Dilution}$. EAD for a revolving purchase facility will be the sum of the current amount of receivables purchased plus 75% of any undrawn purchase commitments minus $K_{Dilution}$ (thus, banking institutions using the advanced IRB approach will not be permitted to use internal EAD estimates for undrawn purchase commitments).

3.203 For drawn amounts, M will equal the pool's exposure-weighted average M (as defined in paragraphs 3.75 to 3.80). This same value of M will also be used for undrawn amounts under a committed purchase facility provided the facility contains effective 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 effective protections, 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.

For purchased receivables, such as factoring and similar transactions, which are deemed short term self liquidating trade transactions, M could be accounted for using the actual remaining maturity. However, M must be at least 90 days.

Dilution Risk

3.204 Dilution refers to the possibility that the receivable amount is reduced through cash or non-cash credits to the receivable's obligor[139]. For both corporate and retail receivables, unless the banking institution can demonstrate to the Bank that the dilution risk for the purchasing banking institution is immaterial, the treatment of dilution risk must be the following:

i) At the level of either the pool as a whole (top-down approach) or the individual receivables making up the pool (bottom-up approach), the purchasing banking institution will estimate the one-year EL for dilution risk, also expressed in percentage of the receivables amount. Banking institutions can utilise external and internal data to estimate EL. As with the treatment of default risk, this estimate must be computed on a stand-alone basis; that is, under the assumption of no recourse or other support from the seller or third-party guarantors.

ii) For the purpose of calculating risk weights for dilution risk, the corporate risk weight function must be used with the PD set equal to the estimated EL, and the LGD set at 100%. An appropriate maturity treatment applies when determining the capital requirement for dilution risk. If a banking institution can demonstrate that the dilution risk is appropriately monitored and managed to be resolved within one year, the Bank may allow the banking institution to apply a one-year maturity.

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

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

Recognition of credit risk mitigants

3.206 Credit risk mitigants will be recognised generally using the same framework as set forth in paragraphs 3.128 to 3.135.[140] In particular, a guarantee provided by the seller or a third party will be treated using the existing IRB rules for guarantees, regardless of whether the guarantee covers default risk, dilution risk, or both.

- If the guarantee covers both the pool's default risk and dilution risk, the pool's total risk weight for default and dilution risk is substituted with the risk weight for an exposure to the guarantor.
- If the guarantee covers only default risk or dilution risk, but not both, the pool's risk weight for the corresponding risk component (default or dilution) is substituted with the risk weight for an exposure to the guarantor. The capital requirement for the other component will then be added.
- If a guarantee covers only a portion of the default and/or dilution risk, the uncovered portion of the default and/or dilution risk will be treated as per the existing credit risk mitigation rules for proportional or tranched coverage (i.e. the risk weights of the uncovered risk components will be added to the risk weights of the covered risk components).

3.207 If protection against dilution risk has been purchased, and the conditions of paragraphs 3.136, 3.137 and 3.144 are met, the double default framework may be used for the calculation of the RWA amount for dilution risk. In this case, paragraphs 3.170 and 3.171 apply with PD_o being equal to the estimated EL, LGD_g being equal to 100%, and M being set according to paragraph 3.204.

Risk-Weighted Assets for Leasing

3.208 Leases other than those that expose banking institutions to residual value risk (refer below) will be accorded the same treatment as if the exposures were collateralised by the underlying leased asset. Banking institutions must ensure

[140] Banking institutions may recognise guarantors that are internally rated and associated with a PD equivalent to BBB- or better under the foundation IRB approach for purposes of determining the capital requirements for dilution risk.

that the minimum requirements for the collateral type must be met (CRE/RRE or other collateral). In addition, the following standards should be met:

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

3.209 Leases that expose banking institutions to residual value risk[141] will be treated in the following manner:

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

B.3.6 CALCULATION OF MINIMUM CAPITAL REQUIREMENT

Regulatory Capital

3.210 [Deleted].

3.211 However, banking institutions using the IRB approach (other than for equity under PD/LGD approach) are required to compare:

i) the total EL amount as calculated within the IRB approach, with

ii) the amount of total eligible provisions,

defined in this section.

3.212 Where the total EL amount exceeds total eligible provisions, banking institutions must deduct the difference in the calculation of CET1 Capital.

[141] Residual value risk is the banking institution's exposure to potential loss due to the fair value of equipment declining below its residual estimate at lease inception.

3.213 Where the total EL amount is less than total eligible provisions, banking institutions may recognise the difference in Tier 2 Capital up to a maximum of 0.6% of credit RWA.

3.214 Banking institutions using the PD/LGD approach for equity exposures must calculate the EL for equity exposures separately from the EL for other exposures. The EL amount for equity exposures under the PD/LGD approach shall be risk-weighted at 1250%.

3.215 For residual exposures that will remain under the standardised approach to credit risk, general provisions[142] as explained in paragraphs 3.228 and 3.229 can be included in the calculation of Tier 2 Capital.

Calculation of Expected Losses

3.216 This section outlines the method by which the difference between provisions and EL may be included in or must be deducted in the calculation of CET1 Capital.

3.217 In general, a banking institution must add up the EL amount (defined as EL multiplied by EAD) associated with its exposures (excluding the EL amount associated with equity exposures under the PD/LGD approach) to obtain a total EL amount.

3.218 Banking institutions must calculate an EL as PD x LGD for corporate, sovereign, bank, and retail exposures, both not in default and not treated as hedged exposures under the double default treatment.

[142] General provisions refer to–
(i) loss allowance measured at an amount equal to 12-month and lifetime expected credit losses as defined under the Malaysian Financial Reporting Standards 9 (these provisions are commonly known as Stage 1 and Stage 2 provisions); and
(ii) regulatory reserves,
to the extent they are ascribed to non-credit-impaired exposures.

3.219 For corporate, sovereign, bank and retail exposures that are in default, banking institutions must use the best estimate of EL as defined in paragraph 3.326. Those under the foundation approach must use the supervisory LGD.

3.220 For equity exposures subject to the PD/LGD approach, the EL is calculated as PD x LGD, except where the minimum and maximum risk weights in paragraphs 3.191 to 3.193 apply. In these cases, the minimum and maximum risk weights are already regarded as UL, thereby rendering any EL-provision calculation unnecessary.

3.221 Banking institutions will not be required to calculate EL for the portion of exposures which have been applied a risk weight cap (i.e. exposures guaranteed by CGC and priority sector housing loans) and exposures subject to a 100% risk weight as per paragraph 3.22.

3.222 For all other exposures, including hedged exposures under the double default treatment, the EL is zero.

3.223 For SL exposures subject to the SSC, the EL amount is determined by multiplying 8% by the RWA produced from the appropriate risk weights, as specified below, multiplied by EAD.

Supervisory Categories and EL Risk Weights for Other SL Exposures

3.224 The EL risk weights for SL, other than HVCRE, are as follows:

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

3.225 Banking institutions meeting the requirements under paragraph 3.168 are allowed to assign preferential EL risk weights falling into the “strong” and “good” supervisory categories as follows:

Strong	Good	Satisfactory	Weak	Default
0%	5%	35%	100%	625%

Supervisory Categories and EL Risk Weights for HVCRE

3.226 The EL risk weights for HVCRE are as follows:

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

Calculation of Provisions

Exposures Subject to IRB Approach

3.227 Total eligible provisions are defined as the sum of all provisions[143] that are attributed to exposures treated under the IRB approach. In addition, total eligible provisions may include any discounts on defaulted assets.

Portion of Exposures Subject to the Standardised Approach to Credit Risk

3.228 Banking institutions applying the standardised approach for the portion of credit risk exposures exempted from the IRB approach (including exposures which have been applied a risk weight cap), either on a permanent or temporary basis as per paragraph 3.4 to 3.6 and 3.14, must determine the portion of general provisions attributed to the standardised or IRB treatment of provisions (see paragraph 3.215), according to the methods outlined in paragraph 3.229.

3.229 Banking institutions should generally attribute total general provisions on a pro rata basis according to the proportion of credit RWA subject to the standardised and IRB approaches. However, when one approach is used to determine credit RWA (i.e. standardised or IRB approach) exclusively within an entity, general provisions booked within the entity using the standardised approach may be attributed to the standardised treatment. Similarly, general provisions booked within entities using the IRB approach may be attributed to the total eligible provisions as defined in paragraph 3.227.

Risk-Weighted Assets

3.230 The Bank reserves the right to require banking institutions to apply a scaling factor[144] to the credit RWA with a view for banking institutions to maintain the

[143] Provisions include all loss allowance as defined under the Malaysian Financial Reporting Standards 9 (and regulatory reserves, if any), partial write-offs and any discounts on defaulted assets.

[144] At this juncture, the Bank proposes to adopt a scaling factor of 1.06 as adopted by the BCBS. This factor was designed to offset the expected decrease in the capital requirement resulting from the change in the capital formula from a EL plus UL orientation, to a UL-only orientation. The size of the

aggregate level of minimum capital requirements, while also providing incentives for banking institutions to adopt the more advanced risk-sensitive approaches of the framework.

Parallel Calculation

3.231 Banking institutions migrating to the IRB approaches for credit risk will be subjected to a one-year parallel calculation prior to actual implementation, whereby banking institutions are required to calculate the credit RWA using the approach under this framework concurrently with the approach the banking institution is currently using (i.e. either the current accord or the standardised approach). During the parallel run period, banking institutions are required to submit to the Bank the computation of their capital adequacy ratio based on the templates provided by the Bank on a quarterly basis. Please refer to the reporting manual for further details on the reporting requirements.

Prudential Capital Floor

3.232 For banking institutions using the IRB approach, there will be a capital floor following implementation of this framework. Banking institutions must calculate the difference between:

i) The capital floor, which is based on application of the current accord[145], or standardised approach. The capital floor is derived by applying an adjustment factor to the following amount:
   - 8% of the RWA under the current requirement, plus
   - Tier 1 and Tier 2 Capital deductions, less
   - General provisions that are recognised in Tier 2 Capital; and

ii) The capital derived from:
   - 8% of total RWA calculated under the IRB framework, plus (or less)
   - Negative (or positive) regulatory adjustments, as specified in Part E of the Capital Adequacy Framework (Capital Components).

scaling factor was derived based on the results of the third Quantitative Impact Study conducted by the BCBS.

[145] Refers to the Risk-Weighted Capital Adequacy Framework (Basel I).

Where a banking institution uses the standardised approach for credit risk for any portion of its exposures, it also needs to exclude general provisions that may be recognised in Tier 2 Capital for that portion from the amount calculated under item (ii) above.

If the floor amount is larger than the capital derived under this framework, banking institutions are required to add 12.5 times the difference between the floor and the capital derived under this framework to the RWA.

3.233 The following table sets out the application of the adjustment factors:

	One year before implementation	From first year of implementation	From second year of implementation	From third year of implementation
Foundation and advanced IRB approaches for credit risk	Parallel calculation	95%	90%	80%

3.234 The Bank may continue to impose the prudential floors beyond the transitional period to provide time to ensure that individual banking institution's implementation of the IRB approaches are sound. Such floors may be based on the approach the institution was using before adoption of the IRB approach, subject to full disclosure of the floors adopted (in terms of adjustment factors and the duration).

B.3.7 MINIMUM REQUIREMENTS FOR THE IRB APPROACH

Overview of Minimum Requirements

3.235 To adopt the IRB approach, banking institutions must demonstrate to the Bank that it has in place a comprehensive framework[146] for model implementation that meets all minimum requirements in this section at the outset and on an

[146] The framework shall cover the entire policies, process and procedures required for the effective implementation of rating systems within the banking institution. Minimum requirements outlined in this section specify the Bank's expectation on various parts of the framework.

ongoing basis. These requirements focus on the ability to rank order and quantify risk in a consistent, reliable and valid manner. Credit risk management standards and practices must also meet the expectations set by the Bank in its risk management guidelines.

3.236 The rationale behind these requirements is that rating and risk estimation systems and processes in place should provide for a meaningful assessment of borrower and transaction characteristics; a meaningful differentiation of risks; and reasonably accurate and consistent quantitative estimates of risks. Furthermore, the systems and processes established must be consistent with internal use of these estimates. The Bank does not intend to prescribe the form or operational details of banking institutions' risk management policies and practices, but will exercise its right to perform detailed review procedures to ensure that systems and controls are adequate to serve as the basis for the IRB approach.

3.237 The minimum requirements set out in this document shall apply to all asset classes unless noted otherwise. The standards related to the process of assigning exposures to borrower or facility grades (and the related oversight, validation, etc.) apply equally to the process of assigning retail exposures to pools of homogenous exposures, unless noted otherwise.

3.238 The minimum requirements set out in this document shall apply to both foundation and advanced approaches unless noted otherwise. Generally, all IRB institutions must produce internal estimates of PD and must adhere to the overall requirements for rating system design, operations, governance and the requisite requirements for estimation and validation of PD measures. Banking institutions wishing to use internal estimates of LGD and EAD must also meet the incremental minimum requirements for these risk factors included in paragraphs 3.322 to 3.326 and 3.330 to 3.347.

3.239 In circumstances where a banking institution is not in full compliance with all the minimum requirements, the institution shall explain the reason for the non-compliance and:

i) Produce a plan for the timely return to full compliance, and seek the Bank's approval thereof; or

ii) Demonstrate to the Bank that the effect of such non-compliance is temporary and immaterial in terms of the risk posed to the banking institution.

Failure to perform either of the above may affect the banking institution's eligibility for the IRB approach. For the duration of any non-compliance, the Bank may require additional capital under Pillar 2 or take other appropriate supervisory action.

Rating System Design

3.240 A rating system comprises all of the methods, processes, controls, and data collection and IT systems that support the assessment of credit risk, the assignment of internal risk ratings, and the quantification of default and loss estimates.

3.241 Within each asset class, a banking institution may utilise multiple rating methodologies/systems. For example, it may have customised rating systems for specific industries or market segments (e.g. middle market, and large corporate). However, banking institutions must not allocate borrowers across rating systems inappropriately to minimise regulatory capital requirements (i.e. cherry-picking by choice of rating system). If multiple rating systems are used, the policies to assign a borrower to a particular rating system must be clear and applied in a consistent manner that best reflects the level of risk of the borrower.

I. Rating System Dimension

Standards for Corporate, Sovereign, and Bank Exposures

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

i) the risk of borrower default, and

ii) transaction-specific factors.

3.243 The first dimension must be oriented to the risk of borrower default. Separate exposures to the same borrower must be assigned to the same borrower grade, irrespective of any differences in the nature of each specific transaction. There are two exceptions to this:

i) Firstly, in the case of country transfer risk, where a banking institution may assign different borrower grades depending on whether the facility is denominated in a local or foreign currency.

ii) Secondly, when the treatment of associated guarantees to a facility may be reflected in an adjusted borrower grade.

In either case, separate exposures may result in multiple grades for the same borrower. A banking institution must articulate in its credit policy the various borrower grades and the associated risks of borrowers in a particular credit grade. Perceived and measured risk must increase as credit quality declines from one grade to the next. The policy must also articulate the risk of each grade in terms of both the description of the probability of default risk typical for borrowers with an assigned grade and the criteria used to distinguish that level of credit risk.

3.244 The second dimension must reflect transaction-specific factors, such as collateral, seniority, product type, etc. and is applicable for banking institutions adopting both the foundation and advanced IRB approaches. Under the foundation IRB approach, this requirement can be fulfilled by the existence of a facility dimension, which reflects both borrower and transaction-specific factors. For example, a rating dimension that reflects EL by incorporating both borrower strength (PD) and loss severity (LGD) considerations would qualify. Likewise a rating system that exclusively reflects LGD would also qualify. Where a rating dimension reflects EL and does not separately quantify LGD, the supervisory estimates of LGD must be used in the capital computation.

3.245 For banking institutions using the advanced approach, facility ratings must reflect exclusively LGD. These ratings can reflect any and all factors that can influence LGD including, but not limited to, the type of collateral, product, industry, and purpose. Borrower characteristics may be included as LGD rating

criteria only to the extent that the characteristics are predictive of LGD. Banking institutions may alter the factors that influence facility grades across segments of the portfolio as long as the factors satisfy the Bank that it further improves the relevance and precision of estimates.

3.246 Banking institutions using the SSC for exposures under the SL sub-class are exempted from this two-dimensional requirement for such exposures. Given the interdependence between borrower/transaction characteristics in SL, banking institutions may satisfy the requirements under this heading through a single rating dimension that reflects EL by incorporating both borrower strength (PD) and loss severity (LGD) considerations. This exemption does not apply to banking institutions using either the corporate foundation or advanced approach for the SL subclass.

Standards for Retail Exposures

3.247 Rating systems for retail exposures must be oriented to both borrower and transaction risk, and must capture all relevant borrower and transaction characteristics. Banking institutions must assign each exposure that falls within the definition of retail into a particular pool. Banking institutions 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 estimations of loss characteristics at the pool level.

3.248 For each pool, banking institutions must estimate PD, LGD, and EAD. Multiple pools may share identical PD, LGD and EAD estimates, even though these are influenced by different risk drivers. At a minimum, the following risk drivers should be considered when assigning exposures to a pool:

i) Borrower risk characteristics (e.g. borrower type, demographics such as age/occupation);

ii) Transaction risk characteristics, including product and/or collateral types (e.g. loan-to-value measures, seasoning, guarantees, and seniority such

as first vs. second charge). Banking institutions must explicitly address cross-collateral provisions where present[147].

iii) Delinquency of exposure: Banking institutions are expected to separately identify exposures that are delinquent and those that are not.

3.249 Banking institutions may also allocate or segment exposures to pools based on scores or PD, LGD and EAD, provided requirements under paragraph 3.247 are met.

II. Rating Structure

Standards for Corporate, Sovereign, and Bank Exposures

3.250 Banking institutions must have a meaningful distribution of exposures across grades with no excessive concentrations, on both its borrower-rating and its facility-rating scales.

3.251 A borrower grade is defined as an assessment of borrower risk on the basis of a specified and distinct set of rating criteria, from which estimates of PD are derived. The grade definition must include both a description of the degree of default risk typical for borrowers assigned the grade and the criteria used to distinguish that level of credit risk. Furthermore, "+" or "-" modifiers to alphabetical or numerical grades will only qualify as distinct grades if the banking institution has developed complete rating descriptions and criteria for assignment, and separately quantifies PDs for these modified grades.

3.252 Banking institutions must have a minimum of seven borrower grades for non-defaulted borrowers and one for those that have defaulted. However, the Bank may require banking institutions to have a greater number of borrower grades if the following characteristics apply:

i) Lending activities are spread over borrowers of diverse credit quality or concentrated in a particular segment; or

[147] In cases where single or multiple collateral(s) is used to secure multiple exposures, banking institution must have a methodology of apportioning the collateral to the appropriate exposures according to seniority and other factors. This should be reflected in assigning exposures to the proper pools.

ii) Undue concentrations of borrowers in specific grades which are not supported by sufficient empirical evidence that the grades cover reasonably narrow PD bands and that the default risk posed by all borrowers in a grade fall within that band[148].

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

3.254 Banking institutions using the SSC for the SL asset classes must have at least four internal grades for non-defaulted borrowers, and one for defaulted borrowers. The requirements for SL exposures that qualify for the corporate foundation and advanced approaches are the same as those for corporate exposures.

Standards for Retail Exposures

3.255 For each pool identified, the banking institution must be able to provide quantitative measures of loss characteristics (PD, LGD, and EAD) for that pool. The level of differentiation 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 be a meaningful distribution of borrowers and exposures across pools. Undue concentration of total retail exposure within a single pool must also be avoided.

III. Rating Criteria

3.256 Banking institutions must have specific rating definitions, processes and criteria for assigning exposures to grades within a rating system. Rating definitions and

[148] Undue concentration also includes cases where bunching is evident in the lower grades from the application of policy grades (e.g. in instances where exposures are moved to a certain borrower grade as a result of the banking institution's internal policy trigger) or downgrades overtime.

criteria must be both plausible and intuitive and must result in a meaningful differentiation of risks.

i) The grade descriptions and criteria must be sufficiently detailed to allow those responsible for assigning ratings to consistently assign the same grade to borrowers or facilities with similar risk. This consistency should exist across lines of business, departments and geographic locations. If rating criteria and procedures differ for different types of borrowers or facilities, banking institutions must monitor for possible inconsistency[149], and shall alter rating criteria to improve consistency, when appropriate.

ii) Rating definitions should be written clearly and with sufficient detail to allow third parties (such as internal audit or other independent functions) to understand and replicate rating assignments and evaluate the appropriateness of the grade/pool assignments.

iii) The criteria must also be consistent with the banking institution's internal lending standards and policies for handling troubled borrowers and facilities.

3.257 To ensure relevance, banking institutions are required to consistently take into account available information that is material and current when assigning ratings to borrowers and facilities. As a general rule, the less information a banking institution has, the more conservative the rating assigned to a borrower and facility grades or pools (for retail exposures). While an external rating can be used as primary factor in determining an internal rating assignment, a banking institution must ensure that it takes into consideration other relevant information.

3.258 Rating criteria and procedures must be periodically reviewed to ensure relevance and resulting ratings are reflective of the current portfolio and reflect external conditions.

[149] This can be achieved through back-testing or by having a controlled, independent group to rate a sample of the borrowers.

SL Product Lines Within the Corporate Asset Class

3.259 Banking institutions using the SSC for SL exposures must assign exposures to internal rating grades based on internal criteria, systems and processes and in compliance with minimum requirements outlined in the framework. The internal rating grades must then be mapped into five supervisory rating categories using the SSC provided in **Appendix VIIa**. The mapping must be conducted for each sub-class of SL exposures.

3.260 The Bank recognises that the criteria banking institutions use to assign exposures to internal grades will not perfectly align with the criteria that define supervisory categories. However, banking institutions must demonstrate that the mapping process has resulted in an alignment of grades which is consistent with the preponderance of the characteristics in the respective supervisory category. Special care must be taken to ensure that any overrides other than internal criteria do not render the mapping process ineffective.

3.261 In cases where the internal grade definition results in an asset being slotted into two possible supervisory categories, the exposures should be assigned to the riskier category. For example, if the internal rating system had one rating that described both the supervisory "strong" and "satisfactory" categories, the exposures should be slotted into the "satisfactory" category.

IV. Rating Philosophy and Assignment Horizon

3.262 Banking institutions whose ratings are used primarily for underwriting purposes are likely to adopt a "through-the-cycle" (TTC) rating philosophy. TTC systems usually assign ratings based on the likelihood of a borrower's survival in a specific macroeconomic stress scenario. Hence, TTC ratings will tend to remain relatively constant as current macroeconomic conditions change over time. On the other hand, banking institutions whose ratings are used for pricing purposes or to track the current portfolio risk are more likely to adopt a "point-in-time" (PIT) rating philosophy. PIT ratings will tend to adjust quickly to changes in the economic environment. In practice, banking institutions usually adopt a 'hybrid' rating approach that embodies characteristics of both the PIT and TTC rating

philosophies. For capital computation purposes, banking institutions are free to adopt the rating philosophy suitable to its own business processes and strategy.

3.263 In any case, banking institutions must document and articulate to the Bank the philosophy of the rating assignment for each of their rating systems. In addition, banking institutions must document how the movements in the economic cycle affect the migration of borrowers across rating grades, and conduct adequate stress tests on banking institutions' portfolio as specified under paragraphs 3.354 to 3.359. Banking institutions must understand the effects of ratings migration on capital requirements and ensure that sufficient capital is maintained during all phases of the economic cycle.

3.264 Although the time horizon used in PD estimation is one year (as described in paragraph 3.297), banking institutions must use a longer time horizon in assigning ratings. A borrower credit rating must represent the banking institution's assessment of the borrower's ability and willingness to contractually perform despite adverse economic conditions or the occurrence of unexpected events. For example, banking institutions may base rating assignments on specific, appropriate stress scenarios. Alternatively, banking institutions may take into account borrower characteristics that are reflective of the borrower's vulnerability to adverse economic conditions or unexpected events, without explicitly specifying a stress scenario. The range of economic conditions that are considered when making assessments must be consistent with current conditions that are most likely to occur over a business cycle within the respective industry/geographic region.

3.265 Given the difficulties in forecasting future events and the influence the events may have on borrower's financial condition, banking institutions must take a conservative view of projected information. Furthermore, where limited data are available, banking institutions must adopt a conservative bias in its analysis.

V. Use of Models in Rating Assignment

3.266 Credit scoring models and other mechanical procedures are permissible as the primary or partial basis of rating assignments. However, these models and procedures are generally developed based on a subset of available information. Although mechanical rating procedures may sometimes avoid some of the idiosyncratic errors made by rating systems in which human judgement plays a large role, the mechanical use of limited information can also be a source of rating errors. Appropriate and experienced judgment and oversight is necessary to ensure that all relevant and material information, including those outside the scope of the model, is taken into consideration.

3.267 The burden is on the banking institution to satisfy the Bank that a model or procedure has good predictive power and that regulatory capital requirements will not be distorted as a result of its use. The variables representing inputs to the model must form a reasonable set of predictors. The model must be accurate on average across the range of borrowers or facilities to which the banking institution is exposed and there must be no known material biases.

3.268 Banking institutions 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 approved rating. In addition, banking institutions must demonstrate that the data used to build the model are representative of the population of the banking institution's actual borrowers or facilities.

3.269 When combining model results with experienced judgment, the banking institution must take into account all relevant and material information not considered by the model. There must be written guidance describing how judgment and model results are to be combined.

3.270 Banking institutions must establish procedures for the review of model-based rating assignments. Such procedures should focus on identifying and limiting

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

3.271 Banking institutions 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.

VI. Documentation of Rating System Design

Standards for All Asset Classes

3.272 Banking institutions must document in writing its rating systems' design and operational details, including, at a minimum, the following:

i) a detailed outline of the theory, assumptions and/or mathematical and empirical basis for the assignment of estimates to grades, individual obligors, exposures, pools, parameters, variables and source of data used in estimation;

ii) an explanation on the treatment of historical data used, including any limitations, during development to ensure depth, scope, reliability, accuracy and completeness;

iii) an articulation of any circumstances under which the rating system does not work effectively;

iv) evidence of compliance with the minimum standards, including appropriate elaborations on portfolio differentiation, rating criteria, responsibilities of parties that rate borrowers and facilities, policies on rating exceptions, parties that have authority to approve exceptions, frequency of rating reviews, and management oversight of the rating process;

v) rationale for choice of specific definitions of default and loss used internally and the assessment of consistency with the reference definitions set out in paragraphs 3.303 to 3.314;

vi) rationale for choice of internal rating criteria and the analyses demonstrating that rating criteria and procedures are likely to result in ratings that meaningfully differentiate risk;

vii) history of major changes in the risk rating process that identifies changes made to the risk rating process subsequent to the last review by the Bank;

viii) the organisation of rating assignments, including the internal control structure.

Additional Standards for Internal Models Approach for Equity

3.273 The documentation should address the following points:

i) The rationale for the choice of internal modelling methodology and the analysis that the model and modelling procedures adopted are likely to result in meaningful estimates of the risk of equity holdings;

ii) Where proxies and mapping are used, these are supported by rigorous analysis performed by the banking institution that demonstrates that all chosen proxies and mappings are sufficiently representative of the risks of the equity holding to which they correspond. The documentation should show, for instance, relevant and material factors (e.g. business lines, balance sheet characteristics, geographic location, company age, industry sector and sub-sector, operating characteristics) used in mapping individual investments to proxies. In summary, banking institutions should be able to prove that the proxies and mappings employed are :

- adequately comparable to the underlying holding or portfolio;
- derived based on relevant and material historical economic and market conditions that are consistent to the underlying holdings or, where inconsistent, the necessary adjustments have been made; and,
- robust estimates of the potential risk of the underlying holding.

VII. Use of External (Vendor) Models

3.274 As a general rule, there should not be a separate set of rules for the use of models obtained from a third-party vendor (hereinafter referred to as external models) nor should the external models be exempted from any of the requirements under this framework. The use of an external model obtained from

a third-party vendor that claims proprietary technology is not sufficient justification for exemption from documentation or any other requirements for adoption of internal rating systems. The burden is on the model's vendor and the banking institution to satisfy the Bank that the model and its use comply with the requirements set out under this framework. For example, the banking institution needs to ensure that models and calibrations are tested at least annually, and that necessary changes to the model are made promptly if necessary. Over reliance on external models might be a threat to the banking institution's ability to fulfil these requirements.

3.275 Banking institutions must also document and be able to explain to the Bank the role of external models and the extent to which they are used within the institution's processes and how risk estimates are derived and validated. Banking institutions must be able to explain the underlying rationale for choosing external models over internally developed models and data. The Bank also expects banking institutions to explain alternative solutions that were considered and how the results compare with the output of the external models.

3.276 Banking institutions must retain in-house expertise on the external models for as long as the models are used for IRB purposes in order to be able to demonstrate a thorough understanding of external models. This includes:

i) Methodological underpinnings and the basic construction of the external models, including an understanding of the models' capabilities, limitations and appropriateness for use in developing IRB risk estimates for the banking institution's own portfolio of exposures;

ii) Effect and significance of the proprietary elements in the external models; and

iii) Rationale behind any adjustment made to the external model's input data sets as well as output.

3.277 Banking institutions must be able to demonstrate the appropriateness of the external models used under the IRB approach. There must be clear linkages and a reasonable degree of consistency and comparability between the external

model inputs, data sets and estimates and banking institutions' own portfolio characteristics and risk rating methodologies. Banking institutions must also ensure that external models are consistent with the requirements for IRB, particularly in relation to data history, definitions of default and validation.

Rating System Operation

I. Rating Coverage

3.278 Banking institutions must ensure that each exposure is assigned to the right rating system, particularly where multiple rating systems are being used. In addition, banking institutions must demonstrate to the Bank that the methodology for assigning exposures to different classes within the corporate asset class is appropriate and consistent over time. In this regard, comprehensive policies and procedures to facilitate differentiation between each asset sub-class within the corporate asset class must be put in place.

3.279 For exposures in the corporate, sovereign and bank asset classes, each obligor and eligible guarantor must be assigned a borrower rating and each exposure must be associated with a facility rating 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.

3.280 For borrowers belonging to a group, group support may be allowed in assigning ratings subject to:

- Banking institutions having in place 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 connected entities; and
- Established governance and control procedures surrounding the adjustments made to the ratings as a result of group support.

3.281 Where group support is taken into account in the assignment of ratings, banking institutions should at a minimum consider the following factors[150]:

- The borrower must be an integral part of the group; and
- The support provider is able to demonstrate the willingness and capacity to support the borrower. For example, a parent company may have a past history of providing material support to the borrower in the form of lending facilities or cash placements.

II. Integrity of the Rating Process

Standards for Corporate, Sovereign, and Bank Exposures

3.282 Rating assignments and periodic rating reviews must be completed or approved by a party that does not directly stand to benefit from the extension of credit. Independence of the rating assignment process can be achieved through a range of practices. These operational practices must be documented in banking institutions' policies and procedure manuals. Credit policies and underwriting procedures must contain and reinforce the independence of the rating process.

3.283 Borrower ratings and facility ratings must be reviewed at least on an annual basis and not later than six months after the publication of the borrower's financial statement. Certain exposures, especially higher risk obligors or problem exposures must be subject to more frequent rating reviews. More frequent reviews of high risk borrowers or problem exposures may be satisfied not only through a more frequent, full re-rating, but also through analysis of interim financial statements, analysis of account behaviour and other measures. In addition, a new rating review must be initiated when material information on the obligor or facility comes to light.

3.284 Banking institutions 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 of such information, banking institutions must have a mechanism to

[150] Group support that has been provided via verbal communication or letters of comfort will not be recognised by the Bank.

update the borrower's ratings in a timely manner. In addition, banking institutions must also establish policies to address stale or outdated ratings.

3.285 The requirement to conduct an annual rating review may be exempted in the following circumstances:

- Where the exposures are fully collateralised by cash or fixed deposits; and
- Where the exposures are part of a portfolio which the banking institution is downsizing due to the withdrawal from a business line or a discontinued business relationship[151], subject to these exposures being immaterial.

Standards for Retail Exposures

3.286 Banking institutions must review the loss characteristics and delinquency status of each identified pool at least on an annual basis. There should also be an ongoing 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. This requirement may be satisfied by review of a representative sample of exposures in the pool.

III. Overrides

3.287 For rating systems based on expert judgment, the circumstances 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, should be clearly documented. For model-based ratings, banking institutions must have guidelines and processes in place for monitoring cases where model ratings have been overridden, including the review of variables that were excluded or inputs that were altered. These guidelines must include identifying personnel that are responsible for approving these overrides. The nature of the overrides must be identified and tracked for performance. It should be demonstrated in back-testing that overrides improve the overall predictive power of the rating system. Banking institutions should clearly specify a threshold expressed in

[151] Exposures arising from a discontinued business relationship shall be considered on a collective basis to determine materiality.

terms of a percentage of ratings overridden, above which an automatic review of the rating model and process would be triggered.

IV. Integrity of Data Input

3.288 In the process of assigning ratings, banking institutions must have in place a process for vetting data inputs which includes an assessment of the accuracy, completeness and appropriateness of the data.

V. Data Maintenance

3.289 Banking institutions must collect and store data on key obligor and facility characteristics to provide effective support to its internal credit risk measurement and management processes, to enable banking institutions to meet the requirements set out under this framework, and to serve as a basis for regulatory reporting. These data should be sufficiently detailed to allow retrospective reallocation of obligors and facilities to grades, for example if the increasing sophistication of the internal rating system suggests that finer segregation of portfolios can be achieved. The data collected on various aspects of the internal ratings should also facilitate Pillar 3 reporting requirements.

3.290 For Islamic banking assets, the data captured should allow banking institutions to assess the performance of the model on the Islamic portfolio. For example, data on the type of underlying Shariah contract is necessary to enable an assessment of the loss characteristics of exposures under a particular Shariah contract and establish if the exposures exhibit risk profiles that are comparable to the portfolio as a whole.

Standards for Corporate, Sovereign, and Bank Exposures

3.291 Banking institutions must maintain at least the following information:

i) Rating histories on borrowers and eligible guarantors, including the rating since the borrower or guarantor was assigned an internal rating;

ii) Dates the ratings were assigned;

iii) Methodology and key data used to derive the rating;

iv) Officer responsible for the most recent rating;

v) Identity of obligors and facilities that default and the timing and circumstances of such defaults;

vi) Data used to derive PD estimates;

vii) Ratings migration; and

viii) Realised default rates associated with borrower grades in order to track the predictive power of the borrower rating system.

3.292 Banking institutions using the advanced IRB approach must also maintain the following information:

i) Complete history of data on the LGD and EAD estimates associated with each facility;

ii) Methodology and key data used to derive the estimate;

iii) Officer responsible for the most recent rating;

iv) Data used to derive LGD and EAD estimates; and

v) The realised rates associated with each defaulted facility.

3.293 Banking institutions that reflect the credit risk mitigating effects of guarantees or credit derivatives through its LGD estimates must retain the following information:

i) Data on the LGD of the facility before and after evaluation of the effects of the guarantee or credit derivative;

ii) Information about the components of loss and recovery for each defaulted exposure including:

- amounts and source of recoveries (e.g. collateral, liquidation proceeds and guarantees); and
- timing of cash flows and administrative costs including date and circumstances of default and exposures in arrears.

3.294 Banking institutions using supervisory estimates (including SSC under the foundation IRB approach) must also collect and retain the relevant data as specified in paragraphs 3.292 and 3.293 to enable the institution to make a comparison between the actual loss experience and the supervisory estimates

prescribed by the Bank. Examples of relevant data include data on loss and recovery experience for corporate exposures under the foundation approach and data on realised losses for banking institutions using the SSC for SL.

Standards for Retail Exposures

3.295 Banking institutions must retain the following information:

i) Data used in the process of allocating retail exposures to pools. This includes the following:
   - Data on obligor and transaction risk characteristics used either directly or through the use of a model;
   - Data on delinquency;

ii) Data on PD, LGD and EAD estimates associated with pools of retail exposures;

iii) For defaulted exposures:
   - Data on the pools to which the retail exposure was assigned over the year prior to default;
   - Identity of obligors and facilities that default;
   - 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 process and guarantees), timing of cash flows and administrative costs; and
   - Data on realised EAD.

Risk Estimation

I. Overall Requirements for Estimation

3.296 This section addresses the broad standards for internal estimates of PD, LGD, and EAD. Generally, all banking institutions using the IRB approaches must estimate a PD for each internal borrower grade for corporate, sovereign and bank exposures or for each pool in the case of retail exposures.

3.297 PD estimates must be a long-run average of one-year default rates for borrowers in a particular grade, or retail pool. Requirements specific to PD estimation are provided in paragraphs 3.315 to 3.321. Banking institutions

adopting the advanced approach must estimate an appropriate downturn LGD (as defined in paragraphs 3.322 to 3.331) for each of its facilities or retail pools. Banking institutions on this approach must also estimate an appropriate long-run default-weighted average EAD for each of its facilities. Requirements specific to EAD estimation are outlined in paragraphs 3.332 to 3.337.

3.298 For corporate, sovereign and bank exposures, banking institutions that do not meet the requirements for own estimates of EAD or LGD above must use the estimates of these parameters determined by the Bank. Standards for use of such estimates are set out in **Part B.3.4**.

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

3.300 Estimates must be based on empirical evidence, including own historical experience, and not based purely on subjective or judgmental considerations. Any changes in lending practice or the process for pursuing recoveries over the observation period must be taken into account. Estimates must promptly reflect the implications of technical advances and new data and other information, as it becomes available. Banking institutions must review these estimates on a yearly basis or more frequently.

3.301 The population of exposures represented in the data used for estimation, and lending standards in use when the data were generated, and other relevant characteristics should be closely matched to or at least comparable with those of the banking institution’s exposures and standards. Banking institutions must also demonstrate that economic or market conditions that underlie the data are relevant to current and foreseeable conditions. The number of exposures in the sample and the data period used for quantification must be sufficient to provide the banking institution with confidence in the accuracy and robustness of its

estimates. The estimation technique must also perform well in out-of-sample tests.

3.302 In general, estimates of PDs, LGDs, and EADs are likely to involve unpredictable errors. In order to avoid over-optimism, banking institutions must add to its estimates a margin of conservatism related to the likely range of errors. Where methods and data reliability are less satisfactory and the likely range of errors is wide, the margin of conservatism must be larger. The Bank may allow some flexibility in application of the required standards for data that are collected prior to the date of implementation of this framework. However, in such cases, banking institutions must demonstrate to the Bank that appropriate adjustments have been made to achieve broad equivalence to the required standards. Data collected after the date of implementation must conform to the minimum standards.

II. Definition of Default

3.303 A default is considered to have occurred when:

i) The banking institution considers that an obligor is "unlikely to repay" in full its credit obligations to the banking group, without recourse by the banking institution to actions such as realising security; **or**

ii) The obligor has breached its contractual repayment schedule and is past due for more than 90 days on any material credit obligation to the banking group, or as provided below:

- Under national discretion, the Bank has elected to apply the following:
  - for loans governed under the Hire-Purchase Act 1967, a default occurs when the borrower is past due for more than 120 days; and
  - for residential mortgages, a default occurs when the borrower is past due for more than 180 days.
- For securities, a default occurs immediately upon breach of contractual repayment schedule.
- For overdrafts, a default occurs when the obligor has breached the approved limits (consecutively) for more than 90 days.

- For obligations with repayments schedule of three months or longer, a default occurs immediately upon breach of contractual repayment schedule.

Where banking institutions have internally adopted a more stringent definition than that prescribed above, the more stringent definition must be applied for purposes of risk estimation under the IRB approach.

3.304 Indicative elements of unlikeliness to pay include but are not limited to the following:

i) Banking institution is uncertain about the collectability of a credit obligation which has already been recognised as revenue and then treats the uncollectible amount as an expense.

ii) Banking institution makes a charge off or an account-specific provision or impairment resulting from a significant decline in credit quality subsequent to taking on the exposure (impairment provisions on equity exposures set aside for price risk do not signal default).

iii) Banking institution sells the credit obligation at a material credit related economic loss. (For securities financing, the facility should not be recorded as a default if the collateral is liquidated not due to the deterioration of an obligor's creditworthiness but to restore an agreed collateral coverage ratio given a fall in the value of collateral and this has been disclosed to the customer in writing at the granting of this facility).

iv) Banking institution consents to a restructuring of the credit obligation where this is likely to result in a diminished financial obligation caused by the material forgiveness, or postponement of principal, interest or (where relevant) fees[152]. This constitutes a granting of a concession that the banking institution would not otherwise consider.

v) Default of a related obligor. Banking institutions must review all related obligors in the same group to determine if that default is an indication of unlikeliness to pay by any other related obligor. Banking institutions must

[152] Including in the case of equity holdings assessed under a PD/LGD approach, such distressed restructuring of the equity itself

judge the degree of economic interdependence between the obligor and its related entities.

vi) Acceleration of an obligation.

vii) An obligor is in significant financial difficulty. An indication could be a significant downgrade of a borrower's credit rating.

viii) Default by the obligor on credit obligations to other financial creditors, e.g. other banking institutions or bondholders.

ix) Banking institution has filed for the obligor's bankruptcy or a similar order in respect of the obligor's credit obligation to the banking group.

x) The obligor has sought or has been placed in bankruptcy or similar protection where this would avoid or delay repayment of the credit obligation to the banking group.

3.305 The default definition under paragraphs 3.303 and 3.304 also applies to *Mushārakah and Mudārabah* contracts for capital computation purposes[153]. However, it should be clarified that pure negligence or misconduct on the part of the partner acting as an agent or *Mudārib* in discharging their roles and responsibilities in a *Mushārakah* and *Mudārabah* contract with banking institutions (i.e. capital provider or rabbumal), on its own, will not automatically constitute a default for capital computation purposes.

Default at Facility Level

3.306 For retail exposures, banking institutions are allowed to apply the definition of default at facility level, rather than at borrower level. For example, a borrower might default on a credit card obligation and not on other retail obligations. However, banking institutions should be vigilant and consider a borrower's cross-default of facilities if a default on one facility is representative of his incapacity to fulfil other obligations.

[153] Islamic banking institutions are required to monitor and maintain data on the default rate and default events under *Mushārakah* and *Mudārabah* contracts including the occurrence of negligence and misconduct by the *Mudārib* for the Bank's supervisory assessment purposes moving forward. In addition, banking institutions are encouraged to establish and adopt stringent criteria for the definition of misconduct, negligence or breach of contracted terms.

3.307 Banking institutions must record actual defaults on IRB exposure classes using this reference definition. Banking institutions must also use the reference definition for its estimation of PDs, and (where relevant) LGDs and EADs. In arriving at these estimations, banking institutions may use available external data which may not be fully consistent with the definition of default subject to the requirements set out in paragraph 3.316. However, in such cases, banking institutions must demonstrate to the Bank that appropriate adjustments to the data have been made to achieve broad equivalence with the reference definition. This same condition would apply to any internal data used prior to the implementation of this framework. Internal data (including that pooled by banking institutions) used in such estimates after the date of implementation of this framework must be consistent with the reference definition.

3.308 If a banking institution considers that a previously defaulted exposure is no longer in default, the PD and LGD for that exposure must be rated as if it is a non-defaulted facility. Should the reference definition subsequently be triggered, a second default would be deemed to have occurred.

Administrative Default

3.309 Administrative defaults include cases where exposures become overdue because of oversight on the part of the obligor and/or the banking institution. Instances of administrative defaults may be excluded from the historical default count, subject to appropriate policies and procedures established by the banking institution to evaluate and approve such cases.

Re-ageing

3.310 Re-ageing is a process by which banking institutions adjust the delinquency status of exposures based on subsequent repayment of arrears or restructuring. This is done when all or some of the arrears under the original repayment schedule have been paid off or repackaged into a new repayment structure.

3.311 Banking institutions must have clearly articulated and documented policies in respect of the counting of days past due, in particular respect of the re-ageing of

the facilities and the granting of extension, deferrals, renewals and rewrites to existing accounts. At a minimum, the re-ageing policy must include:

i) appropriate approving authority and reporting requirements;

ii) minimum age of a facility before it is eligible for re-ageing;

iii) delinquency levels of facilities that are eligible for re-ageing;

iv) maximum number of re-ageing per facility; and

v) reassessment of the borrower's capacity to repay.

3.312 Re-ageing is allowed for both defaulted and delinquent exposures. However, the exposure shall not be immediately 're-aged' if the restructuring causes a diminished financial obligation or material economic loss, or it is assessed that the borrower does not have the capacity to repay under the new repayment structure. For defaulted exposures, re-ageing is permitted after the obligation has been serviced promptly for six months consecutively. For exposures with repayments scheduled at three months or longer, re-ageing is only permitted after the obligation has been serviced promptly for two consecutive payments.

More than One Default Count in a Year

3.313 For quantification purposes, only the first of two or more defaults occurring within twelve months will be counted as default. Hence, for PD measurement, only one default event should be recorded. Accordingly, for advanced IRB, the EAD measure should be defined with reference to the first default event, and the LGD measure should express the economic loss in reference to the first default event, but including losses incurred at any time after this default event until the exposure is reduced to zero or cured.

Treatment of Overdrafts

3.314 Overdrafts must be subject to a credit limit and brought to the knowledge of the borrower. Breaches of the limit must be monitored. If the account was not brought under the limit after 90 to 180 days (subject to the applicable past-due trigger), it would be considered as defaulted. Non-authorised overdrafts will be associated with a zero limit for IRB purposes. Thus, days past due commence once any credit is granted to an unauthorised customer; if such credit was not

repaid within 90 to 180 days, the exposure would be considered in default. Rigorous internal policies must be in place to assess the creditworthiness of customers who are offered overdraft accounts.

III. Requirements Specific to PD Estimation

Standards for Corporate, Sovereign, and Bank Exposures

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

3.316 Banking institutions may have a primary technique and use others as a point of comparison and to support potential adjustments. The mechanical application of a technique without supporting analysis would not be deemed as sufficient by the Bank. Banking institutions must recognise the importance of experienced judgements in combining results of techniques and making adjustments for limitations of techniques and information.

Internal Default Experience

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

Mapping to External Data

ii) Banking institutions may associate or map internal grades to the scale used by an external credit assessment institution or similar institution and then attribute the default rate observed for the external institution's grades to the banking institution's grades. Mappings must be based on a comparison of internal rating criteria to the criteria used by the external institution and on a comparison of the internal and external ratings of any common borrowers. Biases or inconsistencies in the mapping approach or underlying data must be avoided. The external institution's criteria underlying the data used for quantification must be oriented to the risk of the borrower and not reflect transaction characteristics. Banking institutions' analysis must include a comparison of the default definitions used, subject to the requirements in paragraphs 3.303 to 3.309. The basis for the mapping must be documented.

Statistical Default Models

iii) Banking institutions are allowed to use a simple average of default-probability estimates for individual borrowers in a given grade, where such estimates are drawn from statistical default prediction models. Banking institutions' use of default probability models for this purpose must meet the standards specified in paragraphs 3.266 to 3.271.

3.317 Irrespective of whether a banking institution is using external, internal, or pooled data sources, or a combination of the three, for its PD estimation, the length of the underlying historical observation period used must be at least five years from at least one source (except during the transition period). If the available observation period spans a longer period for any source, and this data is relevant and material, the longer period must be used.

Standards for Retail Exposures

3.318 Given the bank-specific basis of assigning exposures to pools, banking institutions must regard internal data as the primary source of information for estimating loss characteristics. Banking institutions are permitted to use

external data or statistical models for quantification provided a strong link can be demonstrated between (a) the banking institution's process of assigning exposures to a pool and the process used by the external data source, and (b) between its internal risk profile and the composition of the external data. In all cases, banking institutions must use all relevant and material data sources as points of comparison.

3.319 One method for deriving long-run average estimates of PD and default-weighted average loss rates given default (as defined in paragraphs 3.322) for retail would be based on an estimate of the expected long-run loss rate. The following may be used:

i) an appropriate PD estimate to infer the long-run default-weighted average loss rate given default, or

ii) a long-run default-weighted average loss rate given default to infer the appropriate PD.

In either case, it is important to recognise that the LGD used for the IRB capital calculation cannot be less than the long-run default-weighted average loss rate given default and must be consistent with the concepts defined in paragraphs 3.322 to 3.329 and 3.331.

3.320 Irrespective of whether banking institutions are using external, internal, pooled data sources, or a combination of the three, for estimation of loss characteristics, the length of the underlying historical observation period used must be at least five years (except during the transition period). If the available observation spans a longer period for any source, and these data are relevant, this longer period must be used. Banking institutions need not give equal importance to historical data if it can convince the Bank that more recent data are a better predictor of loss rates.

3.321 Seasoning[154] can be quite material for some long-term retail exposures characterised by its effects that peak several years after origination. Banking institutions should anticipate the implications of rapid exposure growth and take

[154] Seasoning is defined as the potential change of risk parameters over the life of a credit exposure.

steps to ensure that estimation techniques are accurate, and that current capital level and earnings and funding prospects are adequate to cover future capital needs. To minimise volatility in capital positions arising from short-term PD horizons, all banking institutions are required to adjust PD estimates upward in a consistent manner to capture the potential seasoning effects. Subject to the Bank's approval, banking institutions may disregard such seasoning adjustments if it can be proven that such adjustments are immaterial and do not result in an underestimation of risk for the particular portfolio.

IV. Requirements Specific to Own-LGD Estimates Under the Advanced Approach

Standards for All Asset Classes

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

3.323 As a general rule, consecutive or prolonged periods of negative GDP growth and high unemployment rates may be indicative of an economic downturn for

banking institutions with a well-diversified wholesale portfolio. Banking institutions should also be aware of periods in which observed historical default rates have been elevated for a portfolio of exposures that is representative of the current portfolio. For exposures where common risk drivers (e.g. collateral values) influence the default rates and the recovery rates, banking institutions should refer to periods where those drivers are expected to be distressed when estimating downturn LGD[155].

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

3.325 LGD estimates must be based on historical recovery rates and, when applicable, must not solely be predicated on the collateral's estimated market value. This requirement is premised on the potential inability of banking institutions to gain both control of the collateral and to liquidate it expeditiously. To the extent that LGD estimates take into account the existence of collateral, banking institutions must establish internal requirements for collateral management, operational procedures, assurance of legal certainty and effective risk management as described in **Part B.3.4**.

3.326 Recognising the principle that realised losses can at times systematically exceed expected levels, the LGD assigned to a defaulted asset should reflect the possibility that banking institutions would have to recognise additional, unexpected losses during the recovery period. For each defaulted asset, banking institutions must also construct its best estimate of the EL on that asset based on current economic circumstances and the facility status. The amount, if any, by which the LGD on a defaulted asset exceeds the best estimate of EL on

[155] The Bank will continue to monitor and review the development of appropriate approaches to estimate downturn LGD by banking institutions.

the asset represents the capital requirement for that asset, and should be set by the banking institution on a risk-sensitive basis in accordance with paragraphs 3.160 to 3.163 and 3.173 to 3.177. In general, the best estimate of EL on a defaulted asset should not be less than the sum of loss allowance measured at an amount equal to lifetime expected credit losses for credit-impaired exposures as defined under the Malaysian Financial Reporting Standards 9 (commonly known as Stage 3 provisions) and partial charge-offs on that asset. Any deviation from this will attract the Bank's scrutiny and must be justified by the banking institution.

V. Definition of Loss for All Asset Classes

3.327 The definition of loss used in estimating LGD is economic loss. When measuring economic loss, all relevant factors should be taken into account. This must include material discount effects and material direct and indirect costs associated with collecting on the exposure. Banking institutions must not simply measure the loss recorded in accounting records but must be able to compare accounting and economic losses. Internal workout and collection expertise would significantly influence recovery rates and must be reflected in the LGD estimates, but adjustments to estimates for such expertise must be on a conservative basis until sufficient internal empirical evidence of the impact is available.

Rate for Discounting Recoveries

3.328 Most approaches to quantifying LGDs either implicitly or explicitly involve the discounting of streams of recoveries received after a facility goes into default in order to compare the net present value (NPV) of recovery streams as of a default date with a measure of exposure at default. For the estimation of LGDs, measures of recovery rates should reflect the costs of holding defaulted assets over the workout period, including an appropriate risk premium. When recovery streams are uncertain and involve risk that cannot be diversified away, NPV calculations must reflect the time value of money and a risk premium appropriate to the undiversifiable risk. In establishing appropriate risk premiums for the estimation of LGDs consistent with economic downturn conditions,

banking institutions should focus on the uncertainties in recovery cash flows associated with defaults that arise during the economic downturn conditions. When there is no uncertainty in recovery streams (e.g., recoveries derived from cash collateral), NPV calculations need only reflect the time value of money, and a risk-free discount rate is appropriate. These measures of recovery rates can be computed in several ways, for example:

i) By discounting the stream of recoveries and the stream of workout costs by a risk adjusted discount rate which is the sum of the risk free rate and a spread appropriate for the risk of the recovery and cost cash flows; or

ii) By converting the stream of recoveries and the stream of workout costs to certainty equivalent cash flows and discounting these by the risk free rate; or

iii) By a combination of adjustments to the discount rate, the stream of recoveries and the stream of workout costs that are consistent with the principle of reflecting the costs of holding defaulted assets over the workout period[156] ; or

iv) Other methods for recovery estimation/LGD estimates include observed market value of defaulted bonds, implied value of defaulted bonds, implied LGD based on EL and PD.

3.329 Banking institutions may use cost of capital[157] as a proxy for the funding cost of defaulted assets, which itself is not observable in the absence of a liquid market for such assets. Different discount rates per asset type would not be required if the banking institution uses the cost of capital, as the cost of capital is a sufficiently conservative measure. If a banking institution decides against using the cost of capital, the Bank may be satisfied if it uses a discount rate higher than the contractual or effective interest rate, for exposures other than those that are secured by low risk collateral (for such lower risk exposures, a lower

[156] Banking institutions using the "effective interest rate" in accordance with MFRS 9 as the discount rate must adjust the stream of net recoveries in a manner consistent with this principle.

[157] Banking institutions may use the weighted average cost of capital (WACC) incurred for funding defaulted assets provided that the banking institution is able to demonstrate to the Bank that the method of computation and the inputs used to derive the WACC are robust.

discount rate may be used, e.g. the risk free rate for cash-collateralised exposures is acceptable).

Additional Standards for Corporate, Sovereign, and Bank Exposures

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

Additional Standards for Retail Exposures

3.331 The minimum data observation period for LGD estimates for retail exposures is five years (except during the transition period). The less data a banking institution has, the more conservative it must be in its estimation. It is not necessary to give equal importance to historic data if it can be demonstrated that more recent data are a better predictor of loss rates.

VI. Requirements Specific to Own-EAD Estimates Under the Advanced Approach

Standards for All Asset Classes

3.332 EAD for an on-balance sheet or off-balance sheet item is defined as the expected gross exposure of the facility upon default of the obligor. For on-balance sheet items, banking institution must estimate EAD at no less than the current drawn amount, subject to recognising the effects of on-balance sheet netting as specified in the foundation approach. The minimum requirements for the recognition of netting are the same as those under the foundation approach. The additional minimum requirements for internal estimation of EAD under the advanced approach, therefore, focus on the estimation of EAD for off-balance sheet items (excluding derivatives). Banking institutions under the advanced IRB must have established procedures in place for the estimation of EAD for off-balance sheet items. These procedures must specify the estimates of EAD used for each facility type. Internal estimates of EAD should reflect the possibility of additional drawings by the borrower up to and after the time a

default event is triggered. Where estimates of EAD differ by facility type, the delineation of these facilities must be clear and unambiguous.

3.333 Banking institutions under the advanced approach must assign an estimate of EAD for each facility. It must be an estimate of the long-run default-weighted average EAD for similar facilities and borrowers over a sufficiently long period of time, but with a margin of conservatism appropriate to the likely range of errors in the estimate. If a positive correlation can reasonably be expected between the default frequency and the magnitude of EAD, the EAD estimate must incorporate a larger margin of conservatism. Moreover, for exposures for which EAD estimates are volatile over the economic cycle, banking institutions must use EAD estimates that are appropriate for an economic downturn, if these are more conservative than the long-run average. For banking institutions that have been able to develop their own EAD models, this could be achieved by considering the cyclical nature, if any, of the drivers of such models. Others may have sufficient internal data to examine the impact of previous recession(s). However, some banking institutions may only have the option of making conservative use of external data.

3.334 The criteria by which estimates of EAD are derived must be plausible and intuitive, and represent what the banking institution believes are the material drivers of EAD. The choices must be supported by credible internal analysis. Banking institutions must be able to provide a breakdown of its EAD experience by the factors it sees as the drivers of EAD. All relevant and material information must be used in the derivation of EAD estimates. Across facility types, banking institutions must review its estimates of EAD when material new information comes to light and at least on an annual basis.

3.335 Due consideration must be given to specific policies and strategies adopted in respect of account monitoring and payment processing. Banking institutions 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. Adequate systems and procedures should be in place

to monitor facility amounts, current outstanding against committed lines and changes in outstanding per borrower and per grade. Outstanding balances must be monitored on a daily basis.

Additional Standards for Corporate, Sovereign, and Bank Exposures

3.336 Estimates of EAD must be based on a time period that ideally should cover a complete economic cycle but in any case be no shorter than a period of seven years. If the available observation period spans a longer period for any source, and the data are relevant, this longer period should be used. EAD estimates must be calculated using a default-weighted average and not on a time-weighted average.

Additional Standards for Retail Exposures

3.337 The minimum data observation period for EAD estimates for retail exposures is five years. The less data a banking institution has available, the more conservative estimates should be used. Equal importance given to historical data is not necessary if the more recent data is demonstrated as a better predictor of draw downs.

VII. Requirements for Assessing Effect of Guarantees and Credit Derivatives

Standards for Corporate, Sovereign, and Bank Exposures where Own Estimates of LGD are used and Standards for Retail Exposures

Guarantees

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

3.339 In all cases, both the borrower and all recognised guarantors must be assigned a borrower rating at the outset and on an ongoing basis. Banking institutions must follow all minimum requirements set out in this document for assigning borrower ratings to guarantors, including the regular monitoring of the guarantor's condition and ability and willingness to honour its obligations. Consistent with the requirements in paragraphs 3.291 to 3.293, banking institutions must retain all relevant information on the borrower on a standalone basis excluding the guarantee and the guarantor. In the case of retail guarantees, these requirements also apply to the assignment of an exposure to a pool, and the estimation of PD.

3.340 In no case can a banking institution assign the guaranteed exposure an adjusted PD or LGD such that the adjusted risk weight would be lower than that of a comparable, direct exposure to the guarantor. The rating processes must not consider possible favourable effects of lower correlation between default events for the borrower and guarantor, for purposes of regulatory minimum capital requirements. As such, the adjusted risk weight must not reflect the risk mitigation of double default.

Eligible Guarantors and Guarantees

3.341 There are no restrictions on the types of eligible guarantors. Banking institutions must, however, have clear internal criteria for the types of guarantors recognised for regulatory capital purposes.

3.342 The guarantee must be evidenced in writing, non-cancellable by the guarantor, in force until the debt is satisfied in full (to the extent of the amount and tenor of the guarantee) and legally enforceable against the guarantor in a jurisdiction where the guarantor has assets to attach to the guarantee and where the judgment against the guarantor can be enforced. In contrast to the foundation approach to corporate, bank, and sovereign exposures, conditional guarantees[158] may be recognised under certain conditions. Specifically, the

[158] Guarantees prescribing conditions under which the guarantor may not be obliged to perform.

onus falls on the banking institution to demonstrate that the rating assignment criteria adequately address any potential reduction in the risk mitigation effect.

Adjustment Criteria

3.343 A banking institution must have clearly specified criteria for adjusting borrower grades or LGD estimates (or in the case of retail and eligible purchased receivables, the process of allocating exposures to pools) to reflect the impact of guarantees for regulatory capital purposes. These criteria must be as detailed as the criteria for assigning exposures to grades under paragraphs 3.256 to 3.258, and must follow all minimum requirements for assigning borrower or facility ratings in this framework.

3.344 The criteria must be plausible and intuitive, and must address the guarantor's ability and willingness to perform under the guarantee. The criteria must also address the likely timing of any payments and the degree to which the guarantor's ability to perform under the guarantee is correlated with the borrower's ability to repay. The criteria must also consider the extent to which residual risk to the borrower remains, for example a currency mismatch between the guarantee and the underlying exposure.

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

Credit Derivatives

3.346 The minimum requirements for guarantees above are also relevant for single-name credit derivatives. Additional considerations arise in respect of asset mismatches. In particular, the criteria used for assigning adjusted borrower grades or LGD estimates (or pools) for exposures hedged with credit derivatives must require that the asset on which the protection is based (the reference asset) cannot be different from the underlying asset, unless the conditions outlined in paragraph 3.141 and 3.142 are met.

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

3.348 For banking institutions using foundation LGD estimates, the requirements outlined in paragraphs 3.338 to 3.347 apply with the exception that the 'LGD-adjustment' option cannot be used.

VIII. Requirements Specific to PD and LGD (or EL) Estimation for Purchased Receivables

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

3.350 The purchasing banking institution will be required to group the receivables into sufficiently homogeneous pools so that accurate and consistent estimates of PD and LGD (or EL) for default losses and EL estimates of dilution losses can be determined. In general, the risk bucketing process will reflect the seller's underwriting practices and the heterogeneity of its customers. In addition, the methods and data for estimating PD, LGD, and EL must comply with the existing risk quantification standards for retail exposures.

- In particular, quantification should reflect all information available to the purchasing banking institution regarding the quality of the underlying receivables, including data for similar pools provided by the seller, by the purchasing banking institution, or by external sources.
- The purchasing banking institution must determine whether the data provided by the seller are consistent with expectations agreed upon by both parties concerning, for example, the type, volume and ongoing quality of receivables purchased. Where this is not the case, the purchasing banking institution is expected to obtain and rely upon more relevant data.

Minimum Operational Requirements for Purchased Receivables

3.351 A banking institution purchasing receivables has to demonstrate its confidence that current and future advances can be repaid from the liquidation of (or collections against) the receivables pool. To qualify for the top-down treatment of default risk, the receivable pool and overall lending relationship should be closely monitored and controlled. Specifically, a banking institution must demonstrate the following:

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

ii) *Effective Monitoring Systems*: A banking institution must ensure that:

- It assesses and reviews the default risk correlation of the receivables and the financial conditions of both the seller and servicer;
- Internal policies and procedures are in place to ensure that the receivables, seller and servicer are of high quality. This includes the assignment of an internal risk rating for each seller and servicer;
- Clear and effective policies and procedures are in place to assess the eligibility of the seller and servicer. Periodic reviews of seller and servicer must be conducted either by the banking institution or its agent in order to:
  - verify the accuracy of reports from the seller/servicer;
  - detect fraud or operational weaknesses; and
  - verify the quality of the seller's credit policies and servicer's collection policies and procedures.

  Findings of these reviews must be well documented;

- It has the ability to assess the characteristics and performance of the receivables in the pool, including over-advances, history of the seller's arrears, bad debts, bad debt allowances, payment terms, and potential contra accounts;
- Effective policies and procedures are in place to monitor on an aggregate basis concentrations to a single-receivables obligor both within and across receivables pools; and
- Sufficiently detailed reports on ageing and dilutions of the receivables are received on timely basis to:
  - ensure compliance with the banking institution's eligibility criteria and policies on advances governing purchased receivables; and
  - to facilitate effective monitoring and confirmation of the seller's terms of sale (e.g. invoice date ageing) and dilution.

iii) *Effective Work-Out Systems*: An effective programme requires systems and procedures not only for detecting deterioration in the seller's financial condition and deterioration in the quality of the receivables at an early stage, but also for addressing emerging problems pro-actively. This relates to the need for:

- Clear and effective policies, procedures, and information systems to monitor compliance with all contractual terms of the facility (including covenants, advancing formulas, concentration limits, early amortisation triggers, etc.) and internal policies governing advance rates and receivables eligibility. Systems established should be able to track covenant violations and waivers as well as exceptions to established policies and procedures.
- Limiting inappropriate draw downs, including having in place effective policies and procedures for detecting, approving, monitoring, and correcting over-advances; and
- Effective policies and procedures to deal with sellers or servicers who have been observed to be in distress and/or where the quality of receivable pools has deteriorated. These include, but are not limited to:

- early termination triggers in revolving facilities and other protective covenants;
- a structured and effective approach to deal with covenant violations; and
- clear and effective policies and procedures for initiating legal actions and dealing with problem receivables.

iv) *Effective Systems for Controlling Collateral, Credit Availability, and Cash*: Banking institutions must have clear and effective policies and procedures governing the control of receivables, credit, and cash. In particular:

- Written internal policies that specify all material elements of the receivables purchase programme, including the advancing rates, eligible collateral, necessary documentation, concentration limits, and how cash receipts are to be handled. These elements should take appropriate account of all relevant and material factors, including the seller's/servicer's financial condition, risk concentrations, and trends in the quality of the receivables and the seller's customer base.
- Internal systems must ensure that funds are advanced only against specified supporting collateral and documentation (such as servicer attestations, invoices, shipping documents, etc.)

v) *Compliance with Internal Policies and Procedures*: Given the reliance on monitoring and control systems to limit credit risk, banking institutions should have an effective internal process for assessing compliance with all critical policies and procedures, including:

- regular internal and/or external audits of all critical phases of the banking institution's receivables purchase programme.
- verification of the separation of duties (i) between the assessment of the seller/servicer and the assessment of the receivables obligor and (ii) between the assessment of the seller/servicer and the field audit of the seller/servicer.

An effective internal process for assessing compliance with all critical policies and procedures should also include evaluations of back office

operations, with particular focus on qualifications and experience of staff, staffing levels, and supporting systems.

IX. Requirements Specific to Internal Models Approach for Equity

Capital Charge and Risk Quantification

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

i) The capital charge is equivalent to the potential loss on the institution's equity portfolio arising from an assumed instantaneous shock equivalent to the 99th percentile, one-tailed confidence interval of the difference between quarterly returns and an appropriate risk-free rate computed over a long-term sample period.

ii) The estimated losses should be robust to adverse market movements relevant to the long-term risk profile of the institution's specific holdings. The data used to represent return distributions should reflect the longest sample period for which data are available and be meaningful in representing the risk profile of the specific equity holdings. The data used should be sufficient to provide conservative, statistically reliable and robust loss estimates that are objectively determined and not based purely on subjective or judgmental considerations. Banking institutions must demonstrate to the Bank that the 'shock' employed provides a conservative estimate of potential losses over relevant long-term market or business cycle. Models adopted using data that do not reflect realistic ranges of long-run experience, including a period of reasonably severe declines in equity market values relevant to a banking institution's holdings, are presumed to produce optimistic results unless there is credible evidence of appropriate adjustments built into the model. In the absence of built-in adjustments, banking institution must combine empirical analysis of available data with adjustments based on a variety of factors to attain model outputs that are realistic and conservative. In constructing VaR models to estimate potential quarterly losses, banking institutions may use quarterly data or convert shorter horizon period data

to a quarterly equivalent using an analytically appropriate method supported by empirical evidence. Such adjustments must be applied through a well-developed and documented thought process and analysis. In general, adjustments must be applied conservatively and consistently over time. Furthermore, where only limited data are available, or where technical limitations are such that estimates from any single method will be of uncertain quality, appropriate margins of conservatism must be added to avoid over-optimism.

iii) Any particular type of VaR model that is used (e.g. variance-covariance, historical simulation, or Monte Carlo) must be able to adequately capture all of the material risks inherent in equity returns including both the general market risk and specific risk exposure of the banking institution's equity portfolio. Internal models must adequately explain historical price variation, capture both the magnitude and changes in the composition of potential concentrations, and be sufficiently robust under adverse market conditions. The population of risk exposures represented in the data used for estimation must be closely matched to or at least comparable with equity exposures of the banking institution.

iv) Modelling techniques such as historical scenario analysis may also be used to determine minimum capital requirements for banking book equity holdings. However, the use of such models is conditioned upon the demonstration to the Bank that the methodology and its output can be quantified in the form of the loss percentile specified under (i).

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

vi) Subject to the Bank's review, equity portfolio correlations can be integrated into a banking institution's internal risk measures. The use of explicit correlations (e.g. utilisation of a variance/covariance VaR model) must be fully documented and supported using empirical analysis. The

appropriateness of implicit correlation assumptions will be evaluated by the Bank during the review of model documentation and estimation techniques.

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

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

ix) Estimates of the return volatility of equity investments must incorporate relevant and material available data, information, and methods. Banking institutions may use independently reviewed internal data or data from external sources (including pooled data). The number of risk exposures in the sample, and the data period used for quantification should be sufficient to provide confidence that the estimates used are accurate and robust. Banking institutions should take appropriate measures to limit the potential of sampling or 'survivorship' bias in estimating return volatilities.

x) A rigorous and comprehensive stress testing programme should be established. Banking institutions are expected to subject its internal models and estimation procedures, including volatility computations, to

either hypothetical or historical scenarios that reflect worst-case losses given underlying positions in both public and private equities. At a minimum, stress tests should be employed to provide information about the effect of tail events beyond the level of confidence assumed in the internal models approach.

Risk Management Process and Controls

3.353 Banking institutions must establish policies, procedures, and controls to ensure the integrity of the model and modelling process used to derive regulatory capital. Policies, procedures, and controls should include the following:

i) Full integration of the internal model into the banking institution's overall management information systems, including the management of the banking book equity portfolio. Internal models should be fully integrated into the risk management infrastructure including use in:

- establishing investment hurdle rates and evaluating alternative investments;
- measuring and assessing equity portfolio performance (including the risk-adjusted performance); and
- allocating economic capital to equity holdings and evaluating overall capital adequacy as required under Pillar 2.

Banking institutions should be able to demonstrate, through for example, investment guidelines and investment committee minutes, that the internal model output plays an essential role in the investment management process.

ii) Established management systems, procedures, and control functions for ensuring periodic and independent review of all elements of the internal modelling process, including approval of model revisions, vetting of model inputs, and review of model results, such as direct verification of risk computations. Proxy and mapping techniques and other critical model components should receive special attention. These reviews should assess the accuracy, completeness, and appropriateness of model inputs and results and focus on both identifying and limiting potential errors associated with known weaknesses and be aware of

unknown model weaknesses. Such reviews may be conducted as part of internal or external audit programmes, by an independent risk control unit, or by an external third party.

iii) Adequate systems and procedures for monitoring investment limits and the risk exposures of equity investments. Senior management should be actively involved in the risk control process and ensure that adequate resources and authority are assigned to risk control as an essential aspect of the business. Daily reports prepared by the independent risk control unit must be reviewed by responsible persons within senior management with sufficient seniority and authority to enforce remedial actions where appropriate to reduce the banking institution's overall risk exposure.

iv) The units responsible for the design and application of the model must be functionally independent from the units responsible for managing individual investments. The former should produce and analyse daily reports on the output of the risk measurement model, including an evaluation of limit utilisation. This unit must also be independent from trading and other risk taking units and should report directly to senior management with responsibility for risk management.

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

X. Stress Test in Assessment of Capital Adequacy

3.354 Banking institutions must establish sound stress testing processes for the assessment of capital adequacy. Stress testing must involve identifying possible events or future changes in economic conditions that might have unfavourable effects on a banking institution's credit exposures and credit risk components (PD, LGD and EAD), and an assessment of the banking institution's ability to withstand such changes. For more guidance on stress testing approaches and

methodologies, banking institutions should be guided by the Bank's *Stress Testing*[159].

3.355 In addition, banking institutions must perform credit risk stress tests to assess the effect of certain specific conditions on the IRB regulatory capital requirements. The test to be employed is chosen by the banking institution, subject to the Bank's review. The test employed must be meaningful, reasonably conservative and relevant to the banking institution's circumstances, and consider at least the effect of mild recession scenarios. For example, the use of two consecutive quarters of zero growth to assess the effect on the banking institution's PDs, LGDs and EADs.

3.356 Banking institutions using the double default framework must consider, as part of the stress testing framework, the impact of a deterioration in the credit quality of protection providers (particularly those falling outside the eligibility criteria due to rating changes). Banking institutions should also consider the impact of the default of one but not both of the borrower and protection provider, and the consequent increase in risk and capital requirements at the time of default.

3.357 Whatever method is used, the following sources of information must be considered:

i) banking institution's own data supporting the estimation of the ratings migration of its exposures;

ii) information about the impact of smaller deterioration in the credit environment on a banking institution's ratings, giving some information on the likely effect of more severe stress circumstances; and

iii) evidence of ratings migration in external ratings. This would entail the banking institution broadly matching its buckets to the external rating categories.

3.358 The stress test results may indicate no difference in the capital calculated under the IRB rules if the estimates used as input to the IRB calculation have already

[159] Refer to paragraph 21 of *Stress Testing*.

considered information from stressed circumstances described above. Where there is a shortfall between the results of the stress test and those calculated under the IRB rules, banking institutions must undertake necessary actions to address the differences. Where a banking institution operates in several markets, stress testing on portfolios representing the vast majority of its total exposures should be carried out (in other words, banking institutions need not stress test all the portfolios in all the markets it operates in).

3.359 In addition to the above requirements, banking institutions are required to specifically incorporate the following factors into stress tests under Pillar 2 for purposes of setting internal capital targets:

- The effect of not recognising the firm-size adjustment for small and medium-sized corporates under paragraphs 3.164 and 3.165;
- The effect of not recognising any group support which is allowed under paragraphs 3.280 and 3.281;
- The effect of removing the risk weight cap applied to exposures to priority sector residential mortgages and exposures guaranteed by CGC; and
- The effect of incorporating seasoning adjustment as required under paragraph 3.321, which have been deemed to be immaterial.

Governance, Oversight and Use of Internal Ratings

I. Governance

3.360 The board of directors remains principally responsible for ensuring that a comprehensive framework is in place for the use of internal models. In particular, the framework should address the governance of the IRB systems employed by the banking institution. This responsibility includes approval of high-level issues, major policies and all other material aspects of the IRB systems. The board may delegate certain functions to a designated board committee, but remains accountable for the decisions of such a committee.

3.361 The board must have an adequate understanding of the key principles and features of the banking institution's IRB systems to make well-informed, high-level decisions in relation to its responsibilities (for example, specifying

acceptable risk tolerance levels using IRB results and approving risk management strategies). The requisite information or knowledge may include:

- Basic information about the rating system (for example, objective, coverage, broad rating structure and definitions);
- Uses of rating systems in the banking institution;
- Overall results of validation and back-testing performed on the rating systems and corresponding actions taken;
- Information on the rating systems' compliance with the Bank's guideline; and
- Stress test design, assumptions and results.

3.362 Senior management is responsible for informing and obtaining approval from the board of directors or its designated committee on the material aspects of the internal rating system. At a minimum, these include the following:

- Major rating system policies, including but not limited to ownership, uses of rating systems and the exception framework;
- Material changes or replacement of rating systems (including recalibration, reselection of factors, reweighting, master scale rebanding, change of approach or any adjustment that would significantly impact the output); and
- Changes or exceptions from established policies, and the resulting impact on the banking institution's IRB systems.

3.363 Senior management is responsible to ensure on an ongoing basis that the system is operating as intended and sufficient resources, including qualified and skilled personnel, are assigned to critical aspects of the rating system. Regular communications between management and credit risk management personnel regarding the performance of the rating process, areas needing improvement, and the status of efforts to improve previously identified deficiencies should be an important part of this process.

3.364 Senior management must have a good understanding of the rating system which reflects detailed knowledge of the components of the rating system. The following section illustrates areas of detailed knowledge expected of senior management according to their functional responsibilities:

Heads/Officers of Risk Management in-charge of Active Oversight of Rating Systems:

- Design, estimation (including parameterisation, rating philosophy and horizon), performance monitoring process and assessments, validation process and results and continuing appropriateness of rating systems;
- Underwriting standards, lending practices, collection and recovery practices, and how these factors affect estimation;
- Stress testing processes, including portfolio coverage, design, assumptions, frequency, results, implications and reporting processes;
- Policies, procedures and the control process surrounding the rating system (including segregation of duties, access control, security, and confidentiality of model documentation); and
- Uses of the rating system.

Key Business Heads (the Primary Operator and User of Ratings):

- Approach, objective, purpose and coverage of the rating system;
- Policies and procedures relating to the following:
  - Rating system design, such as rating dimension (borrower vs facility, retail segments), rating structure (modules, number of grades, distribution), rating criteria/definition, philosophy/horizon and documentation; and
  - Rating system operation, namely the means by which the integrity of the system is assured, procedures for overrides and data maintenance;
- Uses of the rating system;
- Stress testing processes, including portfolio coverage, business input on assumptions, results and required management actions; and
- Results of validation/back-testing, identified weaknesses (e.g. data quality) and implications for the use of the rating system, and relevant actions.

Internal Audit:

- Understanding of the Bank's guidelines, especially the minimum requirements for rating systems;
- Good understanding of the critical aspects of the rating systems, including the design, operation, estimation, validation and use of the systems;

- The level of consistency and compliance of the banking institution's rating systems to the Bank's guidelines and internal policies.

3.365 Internal ratings must be an essential part of reporting to the board and senior management. The emphasis is on presenting meaningful analyses which should include, at a minimum, assessments of the following:

i) Distribution of credit/sectoral exposures by grades;

ii) Rating migration;

iii) Estimation of the relevant parameters per grade; and

iv) Model performance and back-testing.

Reporting frequencies may vary with the significance and type of information as well as the specific roles expected of the recipients.

II. Credit Risk Management Function

3.366 Banking institutions must have an independent credit risk management function responsible for the development (design or selection), implementation and performance of internal rating systems. The function must be operationally independent[160] from the business lines or risk taking functions. Areas of responsibility should include:

i) Testing and monitoring internal grades;

ii) 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, grade migration analyses, and monitoring of trends in key rating criteria;

iii) Implementing procedures to verify that rating definitions are consistently applied across functions and geographic areas;

iv) Reviewing and documenting changes to the rating process, including the rationale for such changes; and

v) Reviewing the rating criteria to ensure it remains predictive of risk. Changes to the rating process, criteria or individual rating parameters

[160] The Bank does not dictate which unit within the banking institution that is required to perform the independent function.

must be documented and retained for review by internal or external audit and the Bank.

3.367 The credit risk management function must actively participate in the development, selection, implementation and validation of rating models. This includes the effective oversight of any model used in the rating process. The credit risk management function is also primarily responsible for the ongoing review and control of alterations to rating models.

III. Internal and External Audit

3.368 Internal audit or an appropriately independent function must review at least annually the banking institution's compliance with all applicable minimum requirements for the IRB approach as described in this framework. The result of the review should be reported to the Audit Committee.

3.369 The parties performing this function must possess the necessary skill sets and a good understanding of the internal rating system, to provide an effective check and balance within the institution.

3.370 Banking institutions should consider engaging an external party to undertake the review, at least during the initial period, pending the development of requisite internal audit capabilities. However, the Bank expects such capacity to exist within the institution within a reasonable period to support the internal audit's responsibility to conduct independent reviews. In any case, the Bank reserves the right to require an external auditor to review the banking institution's internal rating systems where reviews by internal audit are found to be inadequate. Any costs associated with the reviews shall be borne by the banking institution.

IV. Use of Internal Ratings

3.371 As a general rule, internal ratings and loss estimates must play an important role in the day to day running of the banking institution's business. This includes its application in credit approval, risk governance and management, and internal

capital allocation. The Bank will not accept ratings systems and estimates designed and implemented exclusively for the purpose of qualifying for the IRB approach and used only to provide inputs for regulatory capital adequacy purposes.

3.372 Banking institutions must demonstrate the use of internal ratings and loss estimates in the following areas[161]:

i) Essential areas: where internal ratings and loss estimates are directly used as input in credit approval, capital management (including internal capital allocations), credit policies, reporting, pricing and limit setting;

ii) Areas for consideration: where internal ratings and loss estimates are indirectly used as input in provisioning decisions, profitability measures, the performance and compensation framework, other elements of the credit process (not only credit approval) and strategy.

3.373 The demonstration of the use of internal ratings does not automatically imply that the estimates must have an exclusive or primary role in all of the above functions. It is recognised that banking institutions may not necessarily apply exactly the same estimates used for capital computation under the IRB, for other internal purposes. For example, pricing models are likely to use PDs and LGDs relevant to the life of the asset. The emphasis is on ensuring the relevance of these estimates for decision making. Where there are adjustments made to the estimates for different business purposes, banking institutions must document and be able to demonstrate its reasonableness to the Bank.

3.374 Rating systems should also form an integral part of a banking institution's risk culture. Although this can only be demonstrated over time, banking institutions should be able to provide evidence of compliance with the essential areas described in **Appendix XXVIII**.

[161] Regardless of any exemption from IRB application granted to a business unit or asset class under paragraph 3.4 to 3.6 and 3.14, although the degree of reliance on internal ratings and loss estimates in these circumstances may differ.

3.375 Banking institutions must have a credible track record in the use of internal ratings information. Rating systems that are in compliance with the minimum requirements under this document should be in use for at least 3 years prior to full implementation. Similar requirements are also applied to the estimation and use of own LGDs and EADs under the advanced IRB approach. Ongoing enhancements to banking institutions' rating systems will not render it non-compliant under this requirement.

Validation of Rating Systems and Internal Estimates

3.376 Validation should encompass a range of processes and activities that evaluate and examine the rating system and the estimation process and methods for deriving the risk components, namely PD, LGD and EAD. Validation should be designed to assess the ability of ratings to adequately differentiate risk and the extent to which PD, LGD and EAD appropriately characterise the relevant aspects of risk.

3.377 Banking institutions must establish a robust framework to validate the consistency of rating systems, processes, and accuracy of the estimation of all relevant risk components. Banking institutions must demonstrate to the Bank that the internal validation process allows for a consistent and meaningful assessment of the performance of internal rating and risk estimation systems. The validation framework, the results of validation and the subsequent review or changes made to the framework, must be fully documented.

3.378 An appropriate design of a validation framework should cover at least the following:

i) Authorised roles and responsibilities for validation;
ii) Scope and methodology of validation;
iii) Reporting and approval procedures;
iv) Frequency of validation; and
v) Management actions.

I. Authorised Roles and Responsibilities for Validation

3.379 Validation must be performed by a unit that is independent from the risk taking units and the development team. Functions responsible for validation must not include individuals who would benefit directly from any adjustments made to the rating system.

3.380 In addition, the validation process should also be subjected to review by internal audit or an appropriately independent party as outlined in paragraph 3.368 to 3.370.

II. Scope and Methodology

3.381 The scope of validation should cover both the quantitative and qualitative aspects of the rating system. The quantitative aspect includes review of developmental evidence, outcome analysis and back-testing:

Review of Developmental Evidence

3.382 The review of developmental evidence should include evaluating the conceptual soundness and the logic of the rating system's theory and methodology. The validation unit should review documentation and empirical evidence supporting the methods used.

3.383 The review conducted should encompass the evaluation of the analysis and statistical tests made during the development phase to assess representativeness of internal data and other available information including external data, against the banking institution's own portfolio. The design of the rating system must be appropriate for its intended use and have no known material biases, either towards a particular customer segment, asset size or economic cycle. The review must demonstrate that the data used to build the model are representative of the population of actual borrowers or facilities.

3.384 The review must also demonstrate that the use of statistical techniques (e.g. sampling, smoothing and sample truncation to remove outliers) in the preparation of development data sets and in the operations of internal rating

systems is justified and based on sound scientific methods. The review should demonstrate that the properties and limitations of the statistical techniques used, and the applicability of these techniques to different types of data are fully understood by key personnel of the banking institution.

3.385 The review must evaluate and demonstrate that the occurrences of missing data are random and do not have systematic relationships with default events or credit losses. Where it is necessary to remove observations with missing data, it should be accompanied with sound justification, as these observations may contain important information on default events or credit losses. Removal of a large number of observations with missing data should be evaluated and justified thoroughly in the review.

3.386 The review must also assess the variables selected in the design and estimation of the rating systems, to verify that variables used as inputs to the system form a reasonable set of predictors. Statistical process or tests conducted to evaluate the performance of individual variables selected and the overall performance during development must also be evaluated.

3.387 The review must also assess the adequacy and efficacy of documentation outlining judgemental decisions or expert opinions engaged in the determination and selection of methods, criteria and characteristics.

Outcomes Analysis and Back-Testing

3.388 Subsequent to development and implementation, the rating system must be reviewed to verify its performance beyond the development stage and to assess how well the rating system works on both existing and new customers (i.e. works well out-of-time).

3.389 An outcome analysis involves ex-post evaluation of the discriminatory power or relative risk-ranking ability of the internal rating system on a regular basis and over time in order to monitor trends and stability. The evaluation must be done at the overall rating system level, going down to the detailed component level

depending on the results of the initial evaluation. At a minimum, all banking institutions should use the Accuracy Ratio (AR) as a common test for discriminatory power. However, banking institutions are expected to also use other measures in addition to AR.

3.390 A comparison between realised default rates and estimated PDs should be performed for each grade to demonstrate that the realised default rates are within the expected range for that grade. At a minimum, this comparison should be done at the overall portfolio level to assess the PD calibration or the anchor point of the model. Banking institutions using the advanced IRB approach must complete analyses on estimates of LGDs and EADs. Such comparisons must make use of historical data over a reasonable period. The methods and data used in such comparisons must be clearly documented.

3.391 To supplement the analysis, a benchmarking of the internal estimates with relevant external (whether public or non-public) data sources should be conducted. The benchmarking must be based on data that are appropriate to the portfolio, updated regularly, and cover a relevant observation period.

3.392 Regardless of the method chosen, banking institutions must be able to explain the rationale and the appropriateness of the chosen validation techniques to the Bank. Banking institutions should also understand the limitations, if any, of such techniques.

Additional Considerations for Quantitative Review

3.393 In addition, banking institutions need to demonstrate to the Bank that the underlying philosophy of the rating system is well understood and properly considered when determining which validation tools and techniques are applied. This applies to both the choice of validation methods for assessing the accuracy and stability of a rating system, and the choice of methods for assessing the appropriateness of the stress tests applied.

3.394 If an outcome of a validation method on a particular portfolio or segment is unreliable because of the lack or total absence of internal default data, other methods and techniques should be considered. Banking institutions should always ensure that relevant additional information is taken into account and adequate margins of conservatism are applied.

3.395 Banking institutions should periodically assess the performance of any external models used in its IRB processes to ensure the models continue to function as intended. Since external model parameters and weights may have been calibrated using external data, it is critical for banking institutions to test the performance of the external models against its own portfolio of exposures. In addition, banking institutions should also undertake procedures to verify the accuracy and consistency of any external data used within its IRB risk quantification processes. This can be done, among other ways, by comparing the results obtained using the external data to the results obtained using its own portfolio data in the same risk rating, segmentation, or parameter estimation models or methods.

3.396 In cases where transparency of the model's development is inadequate and where there is scarcity of internal performance data, banking institutions could also rely on alternative validation approaches. For further guidance on the appropriate treatments, please refer to **Appendix XXIX**.

3.397 Internal assessments of rating systems performance must be based on long data histories, covering a range of economic conditions, and ideally one or more complete business cycles.

3.398 Quantitative testing methods and other validation methods must not vary systematically with the economic cycle. Changes in methods and data (both data sources and periods covered) must be justified and clearly documented.

3.399 Banking institutions should review and improve validation techniques in response to changing markets and practices in the industry as more data becomes available.

Qualitative Review

3.400 Apart from the more technical and quantitative review of the rating system components (data, models, etc.), banking institutions should also review the adequacy and effectiveness of rating system processes, the oversight structure and control procedures to ensure the forward-looking accuracy of the IRB estimates. At a minimum, the review should cover rating system documentation, rating operations (including rating coverage, assignment, reviews, overrides and data maintenance), the governance (including level of understanding and training of personnel in key oversight roles) and control (including independence) framework and internal use of ratings.

Specific Requirements for Validation of Internal Models Approach to Equity

3.401 Banking institutions must establish model review standards, especially where actual results deviate significantly from expectations and the validity of the internal model is called into question. These standards must take into account business cycles and similar systematic variability in equity returns. Adjustments made to internal models in response to model reviews must be well documented and consistent with the model review standards.

3.402 To facilitate model validation through back-testing on an ongoing basis, banking institutions must construct and maintain appropriate databases on the actual quarterly performance of its equity investments and estimates derived from internal models. Banking institutions should also back-test the volatility estimates used within the internal models and the appropriateness of the proxies used in the model.

3.403 Where the Bank deems necessary, banking institutions may be required to adjust quarterly forecasts to shorter time horizons, store performance data for such time horizons and use this for back-testing.

III. Reporting and Approval Process

3.404 Validation results should be deliberated with the development team and business units and brought before the board or its designated board-level committee for deliberation and approval.

IV. Frequency of Validation

3.405 Banking institutions' internal policies must establish the frequency or cycle of the validation exercise and the scope of validation for each cycle. The internal policies should also address situations that may call for validation outside the normal cycle.

3.406 Validation of internal estimates must be conducted prior to the adoption and implementation of IRB and thereafter at least annually. Developmental evidence must be reviewed whenever the banking institution makes material changes to its rating systems.

V. Management Actions

3.407 Banking institutions must have clearly written and properly documented internal standards for the following:

- to determine if the test results conducted to assess the discriminatory power of the rating system are below expectation, leading to a more detailed analysis of the discriminatory power of the model drivers, or to conclude that the power of the rating system has in fact diminished.
- to determine situations in back-testing where deviations in realised PDs, LGDs and EADs from expectations become significant enough to call into question the validity of the estimates. These standards must take account of business cycles and similar systematic variability in default experiences. Where realised values continue to be higher than expected values, banking institutions must revise estimates upward to reflect higher default and loss experience.
- to determine, based on the results of the tests of discriminatory power and back-testing, that the estimates or the model itself needs to be redesigned, recalibrated, or replaced in its entirety.

3.408 Where supervisory estimates of risk parameters, rather than internal ones are being used, banking institutions are expected to compare the realised LGDs and EADs to the supervisory estimates set by the Bank. The information on realised LGDs and EADs should form part of the banking institutions' assessment of internal capital.

3.409 When benchmarking is conducted, banking institutions should investigate the sources of substantial discrepancies between internal estimates and benchmarking sources.

3.410 The Bank recognises that relatively sparse data might require increased reliance on alternative data sources and data-enhancing tools for quantification and alternative techniques for validation. Several of these tools and techniques, most of which are especially relevant for low default portfolios (LDPs) (and for PDs in particular), are described in **Appendix XXIX**. The Bank also recognises that there are circumstances in which banking institutions will legitimately lack sufficient default history to compare realised default rates with parameter estimates that may be based in part on historical data. In such cases, greater reliance must be placed on other validation techniques, including those described in **Appendix XXIX.**

VI. Supervisory Approach to Validation

3.411 The validation of models adopted by banking institutions is ultimately the banking institutions' responsibility. The burden is therefore on the banking institution to satisfy the Bank that a model has good predictive power and that regulatory capital will not be under-estimated as a result of its adoption.

3.412 The Bank will review the results of the validation and independent reviews conducted by banking institutions. The Bank reserves the right to also carry out its own statistical tests on banking institutions' data where necessary.

B.3.8 QUALIFICATION

Overview of Approval and Review Process

3.413 Banking institutions intending to adopt the IRB approach in determining regulatory capital for its conventional and Islamic exposures would be required to seek the Bank's approval.

General Qualification Process

3.414 In general, the qualification process would consist of:

i) Submission of information by the IRB candidate to the Bank;

ii) Review of the submitted information by the Bank within a stipulated period (between three to six months); and

iii) Communication of the outcome of the review to the IRB candidate.

3.415 The approval process conducted by the Bank would cover an offsite assessment of application documents and a detailed on-site examination of banking institutions' operations to assess compliance with the minimum requirements described in this framework.

3.416 The information requirements and minimum expectations of the Bank are outlined in **Appendix XVI**.

3.417 Based on the information requirements, banking institutions must submit to the Bank internal documentation or evidence that it considers relevant for the approval process, such as policies, procedures, technical documents and internal or external audit reports. The Bank reserves the right to request for more detailed information at any point in time during and after the submission of an application is made. Such documents have to be made available upon request without delay to facilitate the timely assessment of the application.

3.418 To facilitate the approval of the IRB approach by the Bank, banking institutions should conduct a self-assessment of its compliance with the minimum requirements described in this framework. Gaps identified from the self

assessment exercise should be documented and reported to the board and the necessary rectification measures taken promptly.

3.419 The IRB implementation program would differ from one IRB candidate to another. Therefore, the review process and approval granted would be specific to the particular circumstances of each banking institution, taking into account its nature, size of operations and implementation progress. In some cases, the approval may be conditional.

3.420 In cases where a banking institution departs from full compliance with all the minimum requirements of this document subsequent to the approval, the requirements in paragraph 3.239 shall apply. The Bank reserves the right to reconsider the banking institution's eligibility for the IRB approach and would consider appropriate supervisory actions.

3.421 Further details on the qualification process are given in **Appendix XXV**.

Home-Host Supervisory Issues

3.422 Locally-incorporated foreign banking institutions may be intending to use or are currently using systems, processes or models that have been developed and adopted by their parent institutions. These centrally-developed systems, processes or models (herein referred to as global/regional models) can be characterised as follows:

- Ownership by either the regional or global risk management committee (in terms of model commission, development and approval);
- Adapted (e.g. in terms of calibration to PD) to the Malaysian market using Malaysian customer/market data either as part of a larger data set, or on its own; and
- Processes and usage of model are largely standardised globally, but may incorporate Malaysian-specific practices.

3.423 Due to the centralisation of the development of the global/regional IRB models, the review process could have already been initiated by the home regulator due to an earlier implementation timeframe adopted by the home regulator.

3.424 Under these circumstances, the Bank would be supportive of coordination with the home regulator in the review of global/regional IRB models in the spirit of home-host cooperation. To assist the Bank, locally-incorporated foreign banking institutions with the intention of adopting global/regional models should submit the following information[162] to the Bank:

- Number of models developed or to be developed outside Malaysia;
- The asset classes covered by the models;
- Estimated coverage in terms of RWA percentage;
- Date rolled out or estimated date for roll out;
- The extent to which documents (development, independent validation) are available locally;
- Whether the home regulator has reviewed or has plans to review the model;
- Where available, detailed assessments by the home regulator, for the purpose of the Bank's review for initial adoption as well as on an ongoing basis;
- Date of last review by the home regulator and the results of the review.

3.425 In general, the Bank's principles and expectations for recognising global/regional models are similar to those applied to locally-developed models. In cases where there are differences between the rules and regulations adopted by the Bank and the home regulator, banking institutions are expected to adopt the more stringent rules.

Changes to IRB Implementation and Adoption

3.426 Changes to the IRB implementation and ongoing adoption may be allowed by the Bank when significant changes occur in the institution's business environment. However, this should be well justified by the institution. Two

[162] If not readily included in the IRB submission as per **Appendix XVI**.

examples that could justify altering a banking institution's rollout policy are fundamental changes in strategy or mergers and acquisitions.

3.427 A change in strategy could result from changes in shareholders or management, or from a new business orientation. In either case, the broad time horizon for rollout should remain the same, but the rollout sequence may change.

3.428 A merger or an acquisition is considered a significant event that is likely to result in a modification to the banking institution's IRB implementation plans. Whether an IRB banking institution acquires a standardised approach banking institution or vice versa, the acquiring banking institution must submit a new plan detailing the RWCAF implementation of the acquired banking institution, including the effects of the acquisition on the consolidated capital position of the group. In an acquisition, the acquiring banking institution is responsible to seek appropriate approval from the Bank for adoption of the IRB approach.

3.429 Banking institutions adopting either the advanced or foundation IRB approach are expected to continue to employ the same approach, unless otherwise permitted by the Bank. A voluntary return from foundation IRB to the standardised approach, or from advanced IRB to the foundation approach, is permitted only under extraordinary circumstances, such as disposal of a large fraction of the credit related business.

3.430 The Bank reserves the right to revoke the IRB status if banking institutions are unable to ensure ongoing compliance with the minimum requirements under this framework.

PART C OPERATIONAL RISK

C.1 INTRODUCTION

4.1 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. Legal risk includes, but is not limited to, exposure to fines, penalties, or punitive damages resulting from supervisory actions, as well as private settlements. For banking institutions operating an Islamic banking operations, legal risk includes *Sharī`ah*-compliance risk[163].

4.2 Two methods of calculating operational risk capital charges are provided here in a continuum of increasing sophistication and risk sensitivity, namely:

- The Basic Indicator Approach (BIA); and
- The Standardised Approach (TSA) or the Alternative Standardised Approach (ASA).

4.3 Banking institutions that have adopted TSA or ASA are not allowed to revert to a simpler approach without the approval of the Bank. However, if the Bank is not satisfied with a banking institution that has adopted TSA or ASA on meeting the qualifying criteria for that approach, the Bank may require the banking institution to use a simpler approach for some or all of its operations. Thereafter, the banking institution shall not revert to the more advanced approach without the approval of the Bank.

C.1.1 SOUND PRACTICES FOR OPERATIONAL RISK MANAGEMENT

4.4 Regardless of the approach adopted for the operational risk capital charge computation, banking institutions shall have in place internal operational risk management framework that commensurate with the nature, complexity and sophistication of their business activities.

[163] Banking institutions that have different internal definition must be able to explain the impact of the difference to the measurement and management of operational risk.

4.5 Banking institutions shall adopt the principles set out in the Bank's *Operational Risk*[164].

4.6 Banking institutions are encouraged to collect operational risk loss data given that the information would enable management to identify potential areas of vulnerability, improve overall risk profile and support decision making. Loss data is also an essential prerequisite to the development and functioning of a credible operational risk measurement system.

C.1.2 TOTAL OPERATIONAL RISK CAPITAL CHARGE

4.7 A banking institution maintaining Islamic banking operation must calculate operational risk capital charge for its conventional and Islamic banking operation separately. The banking institution's total operational risk capital charge will be the sum of:

$$K_{Total}^{165} = K_C + K_i$$

Where

K_{Total} = Total operational risk capital charge

K_c = Operational risk capital charge for conventional banking operations

K_i = Operational risk capital charge for Islamic banking operations

[164] The principles in the paper are generally consistent with the "*Sound Practices for the Management and Supervision of Operational Risk*" issued by the BCBS in February 2003.

[165] For banking institutions that do not operate an Islamic banking operation, the total operational risk capital charge is equivalent to K_C.

C.2 THE BASIC INDICATOR APPROACH (BIA)

4.8 The operational risk capital charge for banking institutions using BIA is equal to the average of a fixed percentage [denoted (α)] of positive annual gross income[166] over the previous three years.

4.9 The formula for calculating the operational risk capital charge under BIA is:

$$K_{BIA} = \{\Sigma(GI_{1...n} \times \alpha)\}/n$$

Where

K_{BIA} = capital charge under BIA

GI = annual gross income of the banking institution, where positive, over the preceding three years[167] as set out in paragraph 4.12

n = number of the preceding three years where annual gross income is positive

α = 15.0%

4.10 A banking institution shall calculate its gross income from its conventional banking operations as the sum of its:

- Net interest income, and
- Net non-interest income

gross of:

- any provisions (for example for unpaid interest), and
- any operating expenses, including fees paid to outsourcing service provider[168]

but does not include

- any realised or unrealised profits/losses from sales or impairment of securities in banking book[169],
- any income or expense from extraordinary or irregular items, and
- any income derived from insurance recoveries.

---

166 Gross income figures are categorised into 12 quarters (equivalent to three years). Recent annual gross income is calculated by aggregating the gross income of the last four financial quarters. Similar manner of aggregation for the next two years preceding the most recent year.

167 If the annual gross income for any given year is negative or zero, the figure shall not be included for the purposes of calculating the operational risk capital charge.

168 In contrast to fees paid for services that are outsourced, fees received by banking institutions' that provide outsourcing services shall be included in the definition of gross income.

169 Refers to profits/losses from securities measured at amortised cost and fair value through other comprehensive income in accordance with Malaysian Financial Reporting Standards 9.

A summary table of the gross income computation is provided in **Appendix XII.**

4.11 A banking institution shall calculate its gross income from its Islamic banking operations as the sum of its:

- Net income from financing activities,
- Net income from investment activities, and
- Other income[170]

gross of:

- any provisions (for example for unpaid income), and
- any operating expenses, including fees paid to outsourcing service provider

but does not include

- any realised or unrealised profits/losses from sales or impairment of securities in banking book
- any income or expense from extraordinary or irregular items, and
- any income derived from insurance recoveries.

Less:

- Income attributable to investment account holders and other depositors.

A summary table of the gross income computation is provided in **Appendix XII.**

4.12 A banking institution shall calculate its annual gross income, separately for both conventional and Islamic banking operations, for the most recent year by aggregating the gross income of the last four financial quarters. The calculation of the annual gross income for the two years preceding the most recent year shall be computed in a similar manner.

[170] Includes income from non-*Sharī`ah* compliant sources.

Example

For banking institutions calculating operational risk capital charge as at end of April 2008, the annual gross income shall be calculated as follows:

	Year 3	Year 2	Year 1
Gross Income for financial quarter ending	March 08 (GI_{3a})	March 07 (GI_{2a})	March 06 (GI_{1a})
	Dec 07 (GI_{3b})	Dec 06 (GI_{2b})	Dec 05 (GI_{1b})
	Sept 07 (GI_{3c})	Sept 06 (GI_{2c})	Sept 05 (GI_{1c})
	June 07 (GI_{3d})	June 06 (GI_{2d})	June 05 (GI_{1d})
Total	**$GI_3 = GI_{3a} + GI_{3b} + GI_{3c} + GI_{3d}$**	**$GI_2 = GI_{2a} + GI_{2b} + GI_{2c} + GI_{2d}$**	**$GI_1 = GI_{1a} + GI_{1b} + GI_{1c} + GI_{1d}$**

4.13 If the annual gross income in any of the given years is negative or zero, this figure is excluded from both the numerator and denominator when calculating the three years average.

Example

Using the above example, the operational risk capital charge as at April 2008 is calculated as follows:

	Year 3	Year 2	Year 1
Gross Income for financial quarter ending	March 08 (+10)	March 07 (+10)	March 06 (+10)
	Dec 07 (+20)	Dec 06 (-30)	Dec 05 (+10)
	Sept 07 (-10)	Sept 06 (-20)	Sept 05 (+10)
	June 07 (+30)	June 06 (+10)	June 05 (+10)
Total	**$GI_3 = 10 + 20 - 10 + 30 = 50$**	**$GI_2 = 10 - 30 - 20 + 10 = (30)$**	**$GI_1 = 10 + 10 + 10 + 10 = 40$**
OR capital charge		**$\{\Sigma[(GI_3 \times \alpha) + (GI_1 \times \alpha)]\} / 2 = 6.75$**	

For newly established banking institutions with less than three years data, the new entity shall use any actual gross income earned to date for purposes of deriving the average gross income, while leaving the gross income for any remaining quarters as zero.

C.3 THE STANDARDISED APPROACH AND ALTERNATIVE STANDARDISED APPROACH

C.3.1 THE STANDARDISED APPROACH[171] (TSA)

4.14 Subject to the Bank's prior approval, banking institutions may use TSA to calculate its operational risk capital charges. The Bank's approval may be given upon its review on the banking institution's compliance with all requirements listed in paragraph 4.17 and 4.18.

4.15 Banking institutions adopting TSA shall classify their business activities into eight business lines, namely, corporate finance, trading and sales, retail banking, commercial banking, payment and settlement, agency services, asset management and retail brokerage. The definition of these business lines are provided in detail in **Appendix XIII.**

4.16 Specific policies shall be put in place covering amongst others the criteria for mapping the gross income of its current business activities into the specified eight business lines. Banking institutions shall review and adjust these policies and criteria for new or changing business activities as appropriate.

4.17 For purposes of mapping its business activities to the appropriate business lines, the following principles must be adhered to:

- All activities must be mapped into the eight business lines (at minimum, to level 1 business lines as described in **Appendix XIII**) in a mutually exclusive and jointly exhaustive manner;
- Any business or non-banking activity which cannot be readily mapped into any of the business lines in paragraph 4.15 and which is an ancillary function to and supports a business line in paragraph 4.15, must be allocated to the business line it supports. If the ancillary activity supports more than one business line, an objective mapping criteria

[171] Applicable to both conventional and Islamic banking operations activities.

must be used to allocate the annual gross income derived from that ancillary activity to the relevant business lines;

- If an activity cannot be mapped into a particular business line in paragraph 4.15 and is not an ancillary activity to a business line, then the activity shall be mapped into one of the business lines with the highest associated beta factor (that is 18%). Any associated ancillary activity to that activity will follow the same business line treatment;
- Internal pricing methods or allocation keys[172] may be used to allocate gross income between business lines provided that the total gross income for the banking institution (as would be recorded under BIA) equals the sum of gross income for the eight business lines;
- The mapping of activities into business lines for operational risk capital purposes must be consistent with the definitions of business lines used for regulatory capital calculations for credit and market risks. Any deviations from this principle and the reason(s) must be clearly documented;
- The mapping process used must be clearly documented. In particular, business line definitions must be clear and detailed enough to allow third parties to replicate the business line mapping. Documentation must, among other things, clearly specify circumstances for exceptions, approval required and any exceptions occurred must be kept on record;
- Processes must be put in place to define the mapping of any new activities or products;
- Senior management is responsible for the mapping policy (which is subject to the approval by the board); and
- The mapping process into business lines must be subject to regular independent reviews by internal and/or external auditors.

[172] Examples of allocation keys among others are number of headcounts/ human resource cost, similar basis used to allocate Head Office expenses to business lines, floor space occupied and customer group.

4.18 Banking institutions adopting TSA, are also required to assess their compliance to the qualitative requirements specified in *Operational Risk*[173], particularly, with respect to the following requirements:

- Active involvement of the board and senior management in the oversight of operational risk management;
- Banking institutions must have an operational risk management system with clear responsibilities assigned to an operational risk management function. The operational risk management function is responsible for developing strategies to identify, assess, monitor and control/mitigate operational risk; for codifying bank-level policies and procedures concerning operational risk management and controls; for the design and implementation of the operational risk assessment methodology; and for the design and implementation of a operational risk-reporting system of the banking institution;
- As part of the banking institution's internal operational risk assessment system, the banking institution must systematically track relevant operational risk data including material losses by business line. Its operational risk assessment system must be closely integrated[174] into its risk management processes;
- There must be regular reporting of operational risk exposures, including material operational losses, to business unit management, senior management and to the board of which appropriate action/s can be taken accordingly;
- Banking institutions' operational risk management system must be well documented. It 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;

[173] The principles in the paper are generally consistent with the "*Sound Practices for the Management and Supervision of Operational Risk*" issued by the BCBS in February 2003.

[174] The output must be an integral part of the process of monitoring and controlling the operational risk profile of the banking institution. For instance, this information must play a prominent role in risk reporting, management reporting, and risk analysis. Banking institutions must have techniques for creating incentives to improve the management of operational risk throughout the bank.

- The 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; and
- The operational risk assessment system (including the internal validation processes) must be subject to regular review by internal and/or external auditors.

4.19 The operational risk capital charge for banking institutions using TSA is calculated as the three-year average of the simple summation of the regulatory capital charges across the eight business lines in each year. The capital charge for each business line is calculated by multiplying the annual gross income by a factor (denoted β) assigned to that business line.

4.20 The formula for calculating the operational risk capital charge under TSA is:

$$K_{TSA} = \{\Sigma_{years\ 1-3}\ max\ [\Sigma(GI_{1-8} \times \beta_{1-8}), 0]\}/3$$

Where

K_{TSA} = capital charge under TSA

GI_{1-8} = annual gross income in a given year for each of the eight business lines

β_{1-8} = a fixed beta factor as detailed below

Business Lines	Beta Factors (%)
Corporate Finance (β_1)	18
Trading and Sales (β_2)	18
Retail Banking (β_3)	12
Commercial Banking (β_4)	15
Payment and Settlement (β_5)	18
Agency Services (β_6)	15
Asset Management (β_7)	12
Retail Brokerage (β_8)	12

4.21 In any given year, negative operational risk capital charges (resulting from negative gross income) in any business line may offset positive operational risk capital charges in other business lines. However, where the aggregate operational risk capital charge across the eight business lines in a given year is negative, then the operational risk capital charge for that year would be set to zero. An illustration of the offsetting rules is provided in **Appendix XIV.**

4.22 Once the banking institution is allowed to use TSA, it is not allowed to adopt BIA without the approval of the Bank.

C.3.2 THE ALTERNATIVE STANDARDISED APPROACH[175] (ASA)

4.23 Subject to the Bank's approval, banking institutions may use ASA to calculate its operational risk capital charge provided that all requirements as listed in paragraphs 4.17 and 4.18 are met and that the Bank is satisfied that ASA provides an improved basis over TSA, for example in avoiding double counting of risks.

4.24 Once the banking institution is allowed to use ASA, it is not allowed to revert to TSA without the approval of the Bank.

4.25 Under ASA, the operational risk capital charge for banking institutions is calculated in the same way as under TSA, except for the retail banking and commercial banking business lines. For these two business lines, the operational risk capital charge is calculated by multiplying the amount of loans and advances by a fixed factor **'m'**. The betas for retail and commercial banking are unchanged as under TSA.

[175] Applicable to both conventional and Islamic banking operations.

4.26 The formula for calculating the operational risk capital charge under ASA is:

$$K_{ASA} = \{\Sigma_{years\ 1\text{-}3}\ max\ [\Sigma(GI_{1\text{-}6} \times \beta_{1\text{-}6}), 0]\} / 3 + (\beta_r \times m \times LA_r) + (\beta_c \times m \times LA_c)$$

Where

K_{ASA} = capital charge under ASA

β_r = the beta for the retail banking (β_3) business line (where β_3 = 12%)

β_c = the beta for the commercial banking (β_4) business line (where β_4 = 15%)

m = fixed factor of 0.035

LA_r = the total outstanding loans and advances of the retail banking[176] business line (non-risk-weighted and gross of provision[177]), averaged over the past three years[178]

LA_c = the total outstanding loans and advances of the commercial banking[179] business line (non-risk-weighted and gross of provision), averaged over the past three years[71]

4.27 The exposure indicator and the relevant beta factor for ASA can be depicted in the following table:

Business Line	Exposure Indicator	Beta Factor (%)
Corporate Finance	GI	18
Trading and Sales	GI	18
Retail Banking	LA_r x m	12
Commercial Banking	LA_c x m	15
Payment and Settlement	GI	18
Agency Services	GI	15
Asset Management	GI	12
Retail Brokerage	GI	12

176 Total loans and advances in the retail banking business line consists of the total drawn amounts in the following credit portfolios: retail, SMEs treated as retail, and purchased retail receivables, including NPLs and loans sold to Cagamas.

177 Covers both general and specific provisions.

178 Simple average of total drawn amount of retail or commercial banking business lines over the 12 most recent quarters.

179 For commercial banking, total loans and advances consists of the drawn amounts in the following credit portfolios: corporate, sovereign, bank, specialised lending, SMEs treated as corporate and purchased corporate receivables, including NPLs. The book value of securities held in the banking book should also be included.

4.28 Under ASA, banking institutions may choose to aggregate the retail and commercial banking by using a beta of 15%. Similarly, banking institutions may choose if they are unable to disaggregate the gross income into the other six business lines, to aggregate the total gross income of the other six business lines by using a beta of 18%. Please refer to the table on the next page.

	Option I		Option II		Option III	
Business Line	**Exposure Indicator**	**Beta Factor (%)**	**Exposure Indicator**	**Beta Factor (%)**	**Exposure Indicator**	**Beta Factor (%)**
Retail Banking	LA_{rc} x m	15	LA_r x m	12	LA_{rc} x m	15
Commercial Banking			LA_c x m	15		
Corporate Finance	GI	18	GI	18	GI	18
Trading and Sales	GI	18				
Payment and Settlement	GI	18				
Agency Services	GI	15				
Asset Management	GI	12				
Retail Brokerage	GI	12				

PART D MARKET RISK

D.1 INTRODUCTION

5.1 This part outlines the approaches used in determining the level of capital held by a banking institution against market risk[180] in its trading book, which comprises of:

- the interest/profit rate and equity risks pertaining to financial instruments in the **trading book**; and
- foreign exchange risk and commodities risk in the **trading and banking books**.

5.2 In determining the consolidated minimum capital requirement, market risk positions in each subsidiary can be netted against positions in the remainder of the group if:

- the risk positions of the group are centrally managed; and
- there are no obstacles to quick repatriation of profits from a foreign subsidiary or legal and procedural difficulties in operationalising timely risk management on a consolidated basis.

Scope of the Capital Charges

5.3 The market risk capital charge in this framework is divided into interest/profit rate risk, equity risk, foreign exchange risk, and commodities risk charges. Banking institutions that have any exposure arising from investment account placements made with Islamic banking institutions shall be subject to the 'look-through' approach as described in **Appendix XXIV**.

5.4 The capital charges for interest/profit rate and equity are applied to the current market value of interest/profit rate and equity related financial instruments or positions in the trading book. The capital charge for foreign exchange risk and commodities risk however are applied to all foreign

[180] Market risk is defined broadly as the risk of losses in on and off-balance sheet positions arising from movements in market prices.

currency[181] and commodities positions. Some of the foreign exchange and commodity positions will be reported and hence evaluated at market value, while some may be reported and evaluated at book value.

Approaches of Measuring Market Risks

5.5 In measuring capital charge for market risk, banking institutions have a choice between two broad approaches, namely, the standardised approach and the internal models approach.

5.6 The Bank expects banking institutions involved in the trading of complex financial instruments to adopt advanced approaches in measuring market risk exposure.

Standardised Approach

5.7 The first option in measuring market risk capital charge is the standardised approach, described in **Part D.2 The Standardised Market Risk Approach.** This is based on a building block approach where standardised supervisory capital charge is applied separately to each risk category.

Internal Models Approach

5.8 The second option in measuring market risks capital charge is the internal models approach described in **Part D.3 The Internal Models Approach**. The adoption of this approach is permitted only upon receipt of written approval from the Bank.

5.9 The approach allows banking institutions to use risk measures derived from internal risk management models. Banking institutions would need to submit the information set out in **Appendix XVII** of this framework to initiate the recognition process of this approach.

[181] However, banking institutions are given some discretion to exclude structural foreign exchange positions from the computation.

5.10 Since the focus of most internal models is only on the general market risk exposure, banking institutions employing internal models are expected to measure the specific risk (that is, exposures to specific issuers of debt securities/*sukūk* or equities) through separate credit risk measurement systems. A separate capital charge for specific risk based on the standardised market risk approach will apply to all banking institution employing internal models, unless the models capture the specific risk and meet the requirements set out in **Part D.3.5 Modelling of Specific Risk.**

5.11 Banking institutions with Islamic banking operations may extend the application of internal models approach for the purpose of measuring market risks capital to the Islamic banking positions in the trading book, subject to the fulfilment of the conditions set out in this Part.

D.1.1 PRUDENT VALUATION GUIDANCE

5.12 This part provides banking institutions with guidance on prudent valuation for positions in the trading book. This guidance is especially important for less liquid positions which, although not excluded from the trading book solely on grounds of lesser liquidity, would raise issues relating to valuation.

5.13 A framework for prudent valuation practices should at a minimum adhere to the requirements specified in paragraph 5.14 to 5.20, covering systems and controls, valuation methodologies, independent price verification, valuation adjustments/reserves.

Systems and Controls

5.14 Banking institutions must establish and maintain adequate systems and controls sufficient to give the management and the Bank's supervisors the confidence that valuation estimates are prudent and reliable. These systems must be integrated with other risk management systems within

the organisation (such as credit analysis). Such systems must be supported by:

- Board-approved policies and procedures on valuation process. This includes clearly defined responsibilities of the various parties involved in the valuation process, sources of market information and review of their appropriateness, frequency of independent valuation, method of determining closing prices, procedures for adjusting valuations, end of the month and ad-hoc verification procedures; and
- Clear and independent (i.e. independent of front office) reporting lines for the department accountable for the valuation process.

Valuation Methodologies

5.15 Banking institutions should mark-to-market portfolio positions, at least on daily basis, based on close out prices that are sourced independently. Examples of readily available close out prices include exchange prices, screen prices, or quotes from several independent reputable brokers. The more prudent side of bid/offer must be used unless the banking institution is a significant market maker in a particular position type and it can close out at mid-market.

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

- Senior management awareness on the assumptions used in constructing the model and their understanding on the materiality of the assumptions used and its impacts in the reporting of the risk/performance of the business;
- Regular review of the appropriateness of the market inputs for the particular positions. Market input for instance, should reflect market prices to the extent possible.

- Consistent adoption of generally accepted valuation methodologies for particular products, where available and appropriate;
- Use of appropriate assumptions, which have been assessed and challenged by suitably qualified parties independent of the development process. In cases where the models are internally developed, the model should be developed or approved independently of the front office. It should be independently tested. This includes validating the mathematics, the assumptions and the software implementation;
- Formal change control procedures in place to govern any changes made to the model and a secure copy of the model should be held and periodically used to check valuations;
- Risk managers awareness of the weaknesses of the models used and how best to reflect those in the valuation output;
- Periodic review to determine the accuracy of the model's performance (for example, assessing continued appropriateness of the assumptions, analysis of P&L versus risk factors, comparison of actual close out values to model outputs); and
- Formal valuation adjustments in place where appropriate, for example, to cover the uncertainty of the model valuation.

Independent Price Verification

5.17 In addition, banking institutions should also conduct regular independent verification of market prices or model inputs for accuracy. Verification of market prices or model inputs should be performed by a unit independent of the dealing room, at least monthly (or, depending on the nature of the market/trading activity, more frequently). It need not be performed as frequently as daily mark-to-market, since the objective is to reveal any error or bias in pricing, which should result in the elimination of inaccurate daily marking.

5.18 Independent price verification should be subjected to a higher standard of accuracy since the market prices or model inputs would be used to determine profit and loss figures, whereas daily markings are used

primarily for management reporting in between reporting dates. For independent price verification, where pricing sources are more subjective, for example, only one available broker quote, prudent measures such as valuation adjustments may be appropriate.

Valuation Adjustments

5.19 Banking institutions must establish and maintain procedures for considering valuation adjustments which should be deducted in the calculation of CET1 Capital. The following valuation adjustments shall be formally considered where relevant: unearned credit spreads, close-out costs, operational risks, early termination, investing and funding costs, future administrative costs and, if appropriate, model risk.

5.20 In addition, banking institution shall consider the need for establishing an appropriate adjustment for less liquid positions. The appropriateness of the adjustments shall be subjected to an ongoing review. Reduced liquidity could arise from structural and/or market events. In addition, close-out prices for concentrated positions and/or stale positions are more likely to be adverse. Banking institutions shall, at the minimum, consider several factors when determining whether valuation adjustment is necessary for less liquid items. These factors include the amount of time it would take to hedge out the risks within the position, the average volatility of bid/offer spreads, the availability of market quotes (number and identity of market makers), and the average and volatility of trading volumes.

D.1.2 CLASSIFICATION OF FINANCIAL INSTRUMENTS

Trading Book Policy Statement

5.21 Banking institutions must have a trading book policy statement with clearly defined policies and procedures for determining which exposures to include in, and to exclude from, the trading book for purposes of calculating regulatory capital. Board and senior management of banking institutions should ensure compliance with the criteria for trading book set

forth in this chapter taking into account the banking institution's risk management capabilities and practices. In addition, compliance with these policies and procedures must be fully documented and subject to periodic internal audit. This policy statement and material changes to it would be subject to the Bank's review.

5.22 These policies and procedures should, at a minimum, address the following general considerations:

- Activities banking institution considers as trading and what constitute part of the trading book for regulatory capital purposes;
- The extent to which an exposure can be marked-to-market daily by reference to an active, liquid two-way market;
- For exposures that are marked-to-model, the extent to which the banking institution can:
  - identify the material risks of the exposure;
  - hedge the material risks of the exposure and the extent to which hedging instruments would have an active, liquid two-way market;
  - derive reliable estimates for the key assumptions and parameters used in the model.
- The extent to which banking institution can and is required to generate valuations for exposure that can be validated externally in a consistent manner;
- The extent to which legal restrictions or other operational requirements would impede banking institution's ability to effect an immediate liquidation of the exposure;
- The extent to which the banking institution is required to, and can, actively risk manage the exposure within its trading operations; and
- The extent to which the banking institution may transfer risk or exposures between the banking and the trading books and criteria for such transfers.

5.23 The above considerations, however, should not be treated as an exhaustive and rigid set of tests that a product or group of related products

must pass for eligibility in the trading book. Rather, the list should serve as minimum or most fundamental areas for considerations for overall management of a banking institution's trading book. It should also be supported by detailed policies and procedures.

Definition of Trading Book

5.24 The trading book consists of positions in financial instruments and commodities held either with trading intent or to hedge other elements of the trading book. To be eligible for trading book capital treatment, financial instruments must either:

- be free of any restrictive covenants on tradability; or
- be able to be hedged.

In addition,

- positions should be frequently and reliably valued; and
- portfolio is actively managed.

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

Financial Instruments

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

A financial asset is any asset that is cash, the right to receive cash or another financial asset; or the contractual right to exchange financial assets on potentially favourable terms; or an equity instrument. A financial liability is the contractual obligation to deliver cash or another financial asset or to exchange financial liabilities under conditions that are potentially unfavourable.

5.26 The following are the basic eligibility requirements for positions to receive trading book capital treatment:

- Clearly documented overall trading strategy for positions/portfolios contained within the trading book as approved by senior management (which would include expected holding horizon etc.).
- Clearly defined policies and procedures for active management of the positions, which must include requirements for:
  - management of positions by a trading desk;
  - setting and monitoring of position limits to ensure their appropriateness;
  - dealers to be given the autonomy to enter into/manage the position within agreed limits and according to the agreed strategy;
  - marking-to-market of positions at least daily and when marking-to-model, relevant parameters (for example volatility inputs, market risk factors, etc.) to be assessed on a regular basis;
  - reporting of positions to senior management as an integral part of the banking institution's risk management process; and
  - actively monitoring of positions with references to market information sources (assessment should be made of the market liquidity or the ability to hedge positions or the portfolio risk profiles). This would include assessing the quality and availability of market inputs to the valuation process, level of market turnover, size of positions traded in the market, etc.
- Clearly defined polices and procedures to monitor the positions against the banking institution's trading strategy including the monitoring of turnover and stale position in the banking institution's trading book.

5.27 All other exposures that are not defined as trading book positions should be classified as exposures in the banking book. This will include both on- and off-balance sheet positions.

Classification of Specific Financial Instruments

5.28 Equity investments called for by the Federal Government of Malaysia, Bank Negara Malaysia, Association of Banks in Malaysia, Association of Islamic Banking Institutions in Malaysia, or Malaysian Investment Banking Association shall be treated as banking book positions where the capital requirement is set forth in paragraphs 2.44, 3.4(iii) and 3.195.

5.29 All defaulted financial instruments will be treated as banking book positions and will be subjected to the capital requirement of this framework.

5.30 Generally, all derivative instruments should be classified in the trading book except for derivatives which qualify as hedges for banking book positions. However, certain credit derivatives instruments and structured investments may be classified as banking book positions particularly for long-term investments which are illiquid and/or have significant credit risk elements.

5.31 Repo and reverse repo transactions shall be assessed based on the trading book definition outlined in paragraphs 5.24 to 5.27.

D.1.3 TREATMENT OF MONEY MARKET INSTRUMENTS IN TRADING BOOK

5.32 Money market transactions such as the issuance and purchase of Negotiable Instrument of Deposits (NIDs), treasury bills, banker's acceptances, commercial papers and interbank borrowings and lendings, may be recognised in the trading book provided they fulfil the requirements set in paragraphs 5.24 to 5.27. Such money market transactions identified for inclusion in the trading book should be committed at market rates, and appropriately identified[182] by the trading desk at deal inception as

[182] The identified money market transactions may be entered with either a third party or with the banking book desk (internal deals). In addition to the requirements set in paragraph 5.36, internal deals must be institutionalised and documented in banking institutions' policies and procedures and should be supported by a robust fund transfer pricing (FTP) system.

transactions made with the trading intent consistent with the definition in paragraph 5.25. Customer deposits and loans/financing do not qualify for this treatment since these products fall outside the definition of money market instruments.

Controls to Prevent Regulatory Capital Arbitrage

5.33 Regulatory capital arbitrage arises when a position attracts a different regulatory capital requirement depending on its classification. It is the responsibility of banking institutions' compliance officers, risk manager and/or internal auditors to ensure that proper procedures are in place, and items are properly classified into either the trading or banking books.

5.34 Banking institutions must ensure that classification of financial instruments are determined up-front and clear audit trails are created at the time the transactions are entered into, to facilitate monitoring of compliance. These audit trails and documentation should be made available to the Bank's supervisors upon request.

5.35 To ensure that financial instruments held for trading are not included in the banking book, financial instruments in the banking book shall not be sold unless prior approval of the board has been obtained. In turn, the board shall ensure that there is no element of intention to trade when selling banking book positions. Each banking institution shall include this requirement in the trading book policy statement.

5.36 Authority to sell banking book instruments may be delegated to Asset and Liability Management Committee (ALCO) or Risk Management Committee (RMC) or any board-appointed signatories provided that the board spells out the specific policies under which such delegation may be applied. The policy should include at the minimum the following parameters:

- the sale does not tantamount to a trading position; and
- the board be informed of the sale of the banking book instruments soonest possible.

5.37 Supervisory intervention involving remedial actions may be instituted if there is evidence that banking institutions undermine the capital adequacy requirements through improper classification of financial instruments between the trading and banking books. The Bank may, for instance, require banking institutions to reclassify banking book positions which exhibit patterns of regular trading to the trading book and vice versa.

Treatment of Hedging Positions

5.38 In general, a hedge can be defined as a position that materially or entirely offsets the component risk elements of another position or portfolio.

5.39 Banking institutions are required to have board-approved written policies which document the criteria of a hedge position and its effectiveness[183]. Banking institutions are required to identify hedge positions at the time the hedging positions are created and to monitor and document with clear audit trails the subsequent performance of the positions.

5.40 Trading book positions entered with a third party to hedge banking book positions are carved out and not subject to market risk capital charge provided the following conditions are satisfied:

- Approval of ALCO/RMC or any authorities delegated by the board is obtained with endorsement that the positions comply with internal hedge policies;
- At the inception of the hedge, there is proper documentation of the hedge relationship and the banking institution's risk management objectives and strategy for undertaking the hedge. Documentation should include:
  - the description of the hedge and the financial instruments designated as the hedging instruments and their values;
  - the nature of the risk being hedged and demonstrate how the risk is being reduced by the hedge;

[183] The Bank does not expect the standards for hedging requirements for purpose of this framework to be identical to that required under the accounting standards.

- defining the acceptable level of hedging effectiveness and periodically assessing the hedging instrument's effectiveness in offsetting the risk of the underlying exposure; and
- the treatment of the hedging instrument and the underlying exposure when the hedge ceases to be effective.

- The identification and tagging of the underlying hedged portfolio/ transaction and hedge instrument are done upfront; and
- The hedge is materially effective in offsetting the risk element of the hedged exposure. The actual performance of the hedge should be back tested against the expected performance as documented at inception. When the hedge position ceases to be effective or when the underlying banking book position ceases, the hedging relationship should be derecognised. The derivatives should be reclassified as trading book transactions and be subject to market risk capital charge.

5.41 When internal hedging transactions are entered into between the trading and banking book to hedge banking book *market risk* exposures, the trading book leg of the transaction shall be subject to market risk capital charge provided that the internal hedging transaction complies with the requirements set in paragraph 5.40.

5.42 However, internal hedging transactions between the trading and banking book to hedge a banking book *credit risk* exposure using a credit derivative are not recognised for capital purposes unless the banking institution purchases a credit derivative meeting the requirements of the credit risk component of this framework from an eligible third party protection provider. Where such third party protection is purchased and is recognised as a hedge of a banking book exposure for regulatory capital purposes, the internal or external credit derivative hedge would be carved out from the trading book and would not be subject to the regulatory capital in this framework.

D.1.4 TREATMENT OF COUNTERPARTY CREDIT RISK IN THE TRADING BOOK

5.43 Banking institutions will be required to calculate the counterparty credit risk charge for over the counter (OTC) derivatives, repo-style and other transactions classified in the trading book, in addition to the capital charge for general market risk and specific risk.[184] The calculation of the counterparty credit risk charge will be based on the approaches as prescribed in the credit component of this framework. Banking institutions using the standardised approach in the banking book will use the standardised approach risk weights in the trading book, and banking institutions using the IRB[185] approach in the banking book will use the IRB risk weights in the trading book in a manner consistent with the IRB roll out plan for portfolio in the banking book.

5.44 Instruments in the trading book that are held under reverse repo transactions may be used as eligible collaterals. The haircut treatment for these eligible collaterals is prescribed in the credit risk component of this framework.

Credit Derivatives

5.45 The counterparty credit risk charge for single name credit derivative transactions in the trading book will be calculated using the following potential future exposure add-on factors:

[184] The treatment for unsettled FX and securities trades are set forth in the credit risk component of this framework.

[185] Applicable when the IRB Guidelines are issued.

	Protection Buyer	Protection Seller
Total Return Swap		
Investment grade reference obligation	5%	5%
Non investment grade reference obligation	10%	10%
Credit Default Swap		
Investment grade reference obligation	5%	5%*
Non investment grade reference obligation	10%	10%*

There will be no difference depending on residual maturity.
Investment grade refers to securities with an external credit rating of BBB+ and above.
* The protection seller of a credit default swap shall only be subject to the add-on factor where it is subject to closeout upon the insolvency of the protection buyer while the underlying is still solvent. Add-on should then be capped to the amount of unpaid premiums.

5.46 Where the credit derivative is a first to default transaction, the add-on will be determined by the lowest credit quality underlying in the basket that is if there are any non-qualifying items in the basket, the non-qualifying reference obligation add-on should be used. For second and subsequent to default transactions, underlying assets should continue to be allocated according to the credit quality that is the second lowest credit quality will determine the add-on for a second to default transaction etc.

D.2 THE STANDARDISED MARKET RISK APPROACH

D.2.1 INTEREST/PROFIT RATE RISKS

5.47 This part describes the standard framework for measuring the risk of holding or taking positions in debt securities/*sukūk*[186] and other interest/profit rate related financial instruments in the trading book. The financial instruments covered include all fixed-rate and floating-rate debt securities/*sukūk* and instruments that share similar characteristics as debt securities/*sukūk*, including non-convertible preference shares. Interest/profit rate exposures arising from forward foreign exchange transactions, derivatives and forward sales and purchases of securities[187] are also included. Convertible bonds, that is debt issues or preference shares that are convertible into common shares of the issuer, will be treated as debt securities/*sukūk* if the instruments trade like debt securities/*sukūk* or as equities.

5.48 Interest/profit rate sensitive instruments are normally affected by general changes in market interest/profit rate, known as general risk, and changes in factors related to a specific issuer, in particular issuer's credit quality, which would affect the instrument, known as specific risk.

5.49 The minimum capital requirement for interest/profit rate risk is the summation of the capital charges for:

a) Specific risk of each security, whether it is a short or a long position; and
b) General market risk where long and short positions in different securities

or instruments may be offset.

[186] Includes private commercial enterprise's sukūk trading activities where the Islamic banking operation has *mushārakah* and/or *muḍārabah* financing.

[187] This includes primary issuance or underwriting of debt securities where rates have been fixed upfront for which the position would be treated as a bond forward or bond option transaction. Refer to **Part D.1.4 Treatment of Options - Underlying Position Approach** for capital charge calculation.

Specific Risk

5.50 The capital requirement for specific risk is designed to protect against adverse movements in the price of an individual security owing to factors related to the issuer. In measuring the risk, offsetting will be restricted to matched positions in the identical issue. Even if the issuer is the same, no offsetting is 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

5.51 **Table 2** provides the applicable specific risk charges for interest/profit rate related financial instruments for issuers of G10[188] and non-G10 countries.

5.52 The specific risk charges for the holding of interest/profit rate related financial instruments issued by banking institutions will be based on the external ratings[189] of the banking institutions while the specific risk charges for the holding of interest/profit rate related financial instruments issued by foreign sovereigns will be based on the external ratings of the foreign sovereigns. For example, if a banking institution holds a 5-year sovereign debt paper which has a sovereign rating of A, the specific risk charge will be 1.6% as provided in **Table 2**. In the case of interest/profit rate related financial instruments issued by corporates, in addition to maturity and external ratings, the country of establishment (that is G10 or non-G10) is also a factor in determining the amount of specific risk weights. For example, the holding of a AA rated Malaysian corporate debt paper with maturity of 3 years will attract a specific risk charge of 2.0%.

[188] The Group of Ten (G10) is made up of eleven industrial countries namely Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States.

[189] As illustrated in Table 2 or the equivalent standard rating category as specified in the credit component of this framework

Table 2: Specific Risk Charges for Interest/Profit Rate Related Financial Instruments

	Remaining Maturity									
	<= 6 mths		> 6m to 1 yr		> 1 to 2 yrs		> 2 to 5 yrs		> 5 yrs	
	G10 (%)	Non G10 (%)	G10 (%)	Non G10 (%)	G10 (%)	Non G10 (%)	G10 (%)	Non G10 (%)	G10 (%)	Non G10 (%)
Corporates & Securitisations$^{\Omega}$										
P1 to P3$^{\theta}$	0.25	0.25	1.00	1.00						
AAA to A-	0.25	0.25	1.00	1.00	1.00	2.00	1.60	2.00	1.60	3.00
BBB+ to BBB-	0.25	0.25	1.00	1.00	1.00	2.00	1.60	3.50	1.60	4.50
BB+ to B-	8.00									
Below B-	12.00									
Unrated	8.00									
Banking Institutions^										
AAA to A-	0.25		1.00		1.00		1.60		1.60	
BBB+ to BBB-	0.25		1.00		2.00		2.00		3.00	
BB+ to B-	8.00									
Below B-	12.00									
Unrated	0.25		1.00		2.00		2.00		3.00	
Public Sector Entities (PSE)*	0.25		1.00		1.00		1.60		1.60	
Malaysian Government$^{\#}$	0									
Foreign Sovereigns										
AAA to AA- §	0									
A+ to BBB-	0.25		1.00		1.00		1.60		1.60	
BB+ to B-	8.00									
Below B-	12.00									
Unrated	8.00									

$^{\theta}$ Also applicable for exposures to IILM Sukuk.

$^{\Omega}$ A specific risk charge of 100 would apply for securitisation exposures held in the trading book if that exposure is subject to a 1250% risk weight if held in the banking book.

^ Including interest/profit rate related financial instruments issued and guaranteed by licensed banking institutions and licensed development financial institutions as well as MDBs which do not qualify for preferential risk weight described in paragraph 2.23.

***** Refer to the credit risk component of this framework for the criteria of PSE.

$^{\#}$ Including interest/profit rate related financial instruments issued or guaranteed by the Malaysian Government or the Bank, as well as securities issued through special purpose vehicles established by the Bank e.g. Bank Negara Malaysia Sukuk Ijarah and BNMNi-*Murabahah* issued through BNM Sukuk Berhad. However, banking institutions shall apply the look-through approach as specified under Appendix XXIV for BNM *Mudarabah* certificate (BMC).

§ Including exposures to highly-rated Multilateral Development Banks (MDBs) that qualify for the preferential risk weight as described in paragraph 2.23.

5.53 In cases where specific risk is considerably underestimated, often involving debt instruments/*sukūk* which have a high yield to redemption relative to government debt securities/*sukūk*, the Bank may:

- require banking institutions to apply a higher specific risk charge to such instruments; and/or
- disallow offsetting for the purposes of defining the extent of general market risk between such instruments and any other debt instruments.

5.54 Securitisation exposures held in the trading book shall be subject to the capital requirements in the market risk component of this framework, applying the specific risk charges applicable to corporates as per Table 2. However, exposures subjected to a risk weight of 1250% under the Part F should similarly be subjected to a 100% capital charge if they are held in the trading book. As an exception, the treatment specified in paragraph 7.14 need not apply for such securitisation exposures retained in the trading book during the first 90 days from the date of issuance.

Specific Risk Capital Charges for Positions Hedged by Credit Derivatives

5.55 Full allowance will be recognised when the values of two legs (that is long and short) always move in the opposite direction and broadly to the same extent. This would be the case in the following situations:

a) the two legs consist of completely identical instruments; or
b) a long cash position is hedged by a total rate of return swap (or vice versa) and there is an exact match between the reference obligation and the underlying exposure (that is the cash position).[190]

In these cases, no specific risk capital requirement applies to both sides of the position.

5.56 An 80% offset will be recognised when the value of two legs (that is long and short) always moves in the opposite direction but not broadly to the same extent. This would be the case when a long cash position is hedged

[190] The maturity of the swap itself may be different from that of the underlying exposure.

by a credit default swap or a credit linked note (or vice versa) and there is an exact match in terms of the reference obligation, the maturity of both the reference obligation and the credit derivative, and the currency to the underlying exposure. In addition, key features of the credit derivative contract (for example credit event definitions, settlement mechanisms) should not cause the price movement of the credit derivative to materially deviate from the price movements of the cash position. To the extent that the transaction transfers risk (that is taking account of restrictive payout provisions such as fixed payouts and materiality thresholds), an 80% specific risk offset will be applied to the side of the transaction with the higher capital charge, while the specific risk requirement on the other side will be zero.

5.57 Partial allowance will be recognised when the values of the two legs (that is long and short) usually moves in the opposite direction. This would be the case in the following situations:

a) the position is captured in paragraph 5.55 (b), but there is an asset mismatch between the reference obligation and the underlying exposure. Nonetheless, the position meets the requirements spelt out in the 'Additional Operational Requirements for Credit Derivatives' in the credit risk component of this framework.

b) the position is captured in paragraphs 5.55 (a) or 5.56 but there is a currency or maturity mismatch[191] between the credit protection and the underlying asset.

c) the position is captured in paragraph 5.56 but there is an asset mismatch between the cash position and the credit derivative. However, the underlying asset is included in the (deliverable) obligations in the credit derivative documentation.

5.58 In cases outlined in paragraphs 5.55 to 5.57, rather than adding the specific risk capital requirements for each side of the transaction (that is

[191] Currency mismatches should be reported under **Part D.2.3 Foreign Exchange Risk**.

the credit protection and the underlying asset) only the higher of the two capital requirements will apply.

5.59 In cases not captured in paragraphs 5.55 to 5.57, a specific risk capital charge will be applied against both sides of the positions.

5.60 With regard to banking institutions' first-to-default and second-to-default products in the trading book, the basic concepts developed for the banking book will also apply. Banking institutions holding long positions in these products (for example buyers of basket credit linked notes) would be treated as if they are protection sellers and would be required to apply the specific risk charges on each of the underlying position based on the external[192] rating of the respective underlying reference asset, if available. Issuers of these notes would be treated as if they are protection buyers and are therefore allowed to off-set specific risk for one of the underlyings, that is the asset with the lowest specific risk charge.

General Interest/Profit Rate Risk

5.61 The capital requirements for general risk are designed to capture the risk of loss arising from changes in market interest/profit rates. Within the standardised approach, banking institution may choose to adopt either the 'maturity' method or the 'duration' method. Upon adoption of a method, banking institutions are not allowed to switch between methods without the consent of the Bank. Under each method, positions are allocated across a maturity ladder template of time bands and the capital charge is then calculated as the sum of four components:

- the net short or long weighted position across the entire time bands[193];
- the smaller proportion of the matched positions in each time band to capture basis risk (the 'vertical disallowance');

[192] As specified under the credit component of this framework.

[193] Positions include delta-weighted option position in the case where the institution decides to use the Delta-plus Method for the treatment of options.

- the larger proportion of the matched positions across different time bands to capture yield curve risk (the 'horizontal disallowance'); and
- a net charge for positions in options, where appropriate (refer to **Part D.2.5 Treatment of Options**).

5.62 Separate maturity ladder templates should be used for positions exposed to different currency interest/profit rate risk. Non-ringgit positions must be translated into ringgit equivalent based on reporting date spot foreign exchange rates. Capital charges for general interest/profit rate risk should be calculated for each currency separately and then aggregated with no offsetting between positions of different currencies. Two different sets of risk weights (**Table 3**) and yield changes (**Table 5**) would be applicable depending on whether the interest/profit rate related financial instrument is exposed to a G10 or non-G10 currency interest/profit rate risk. Zero-coupon bonds/*sukūk* and deep-discount bonds/*sukūk* (defined as bonds/*sukūk* with a coupon less than 3%) should be slotted according to the time-bands set out in the third column of **Table 3**.

Offsetting of Matched Positions

5.63 In calculating general risk, banking institutions may exclude all long and short positions (both actual and notional) in identical instruments with the same issuer, coupon, currency and maturity, from the calculations. No offsetting will be allowed between positions in different currencies; the separate legs of cross-currency swaps or forward foreign exchange deals are treated as notional positions in the relevant instruments and included in the appropriate calculation for each currency interest/profit rate risk.

Maturity Method

5.64 Under the maturity method, the market value of long or short positions in debt securities/*sukūk* and other sources of interest/profit rate exposures, including derivative instruments, are slotted into the relevant time bands as specified in **Table 3**. Fixed-rate instruments shall be allocated according to

the residual term to maturity and floating-rate instruments according to the residual term to the next repricing date.

5.65 The first step in the calculation of the capital charge is to weight the positions in each time band by a risk weight designed to reflect the price sensitivity of those positions to assumed changes in interest/profit rates. The risk weights for each time band are set out in the fourth and fifth column of **Table 3** below according to either G10 or non-G10 countries' currencies. The net short or long weighted position is then obtained.

Table 3: General Interest/Profit rate Risk weights for Financial Instruments Exposed to G10 or Non-G10 Currency

Zone	Time Bands (Coupon 3% or more)	Time Bands (Coupon less than 3%)	G10 Risk weight (%)	Non-G10 Risk weight (%)
1	1 month or less	1 month or less	0.00	0.00
	> 1 and up to 3 months	> 1 and up to 3 months	0.20	0.20
	> 3 and up to 6 months	> 3 and up to 6 months	0.40	0.50
	> 6 and up to 12 months	> 6 and up to 12 months	0.70	0.80
2	> 1 and up to 2 years	> 1.0 and up to 1.9 years	1.25	1.30
	> 2 and up to 3 years	> 1.9 and up to 2.8 years	1.75	1.90
	> 3 and up to 4 years	> 2.8 and up to 3.6 years	2.25	2.70
3	> 4 and up to 5 years	> 3.6 and up to 4.3 years	2.75	3.20
	> 5 and up to 7 years	> 4.3 and up to 5.7 years	3.25	4.10
	> 7 and up to 10 years	> 5.7 and up to 7.3 years	3.75	4.60
	> 10 and up to 15 years	> 7.3 and up to 9.3 years	4.50	6.00
	> 15 and up to 20 years	> 9.3 and up to 10.6 years	5.25	7.00
	> 20 years	> 10.6 and up to 12 years	6.00	8.00
		> 12 and up to 20 years	8.00	10.40
		> 20 years	12.50	16.40

Vertical Disallowance

5.66 The next step in the calculation is to offset the weighted longs and shorts within each time band, resulting in a single short or long position for each band.

5.67 Since each band would include different instruments and different maturities, a 10% capital charge to reflect basis risk and gap risk will be levied on the smaller of the offsetting positions (that is the matched position), be it long or short, in each time band. Thus, if the sum of the

weighted longs in a time band is RM100 million and the sum of the weighted shorts is RM90 million, the so-called 'vertical disallowance' for that time band would be 10% of RM90 million (that is RM9 million).

Horizontal Disallowance

5.68 From the results of the above calculations, two sets of weighted positions, the net long or short position in each time band, would be produced. The maturity ladder is then divided into three zones defined as zero to one year, more than one year to four years and more than four years. Banking institutions will then conduct two further rounds of offsetting, first between the net time band positions within each zone and secondly between the net positions across the three different zones (that is, between adjacent zones and non-adjacent zones). The residual net position in each zone may be carried over and offset against opposite positions in other zones when calculating net positions between zones 2 and 3, and 1 and 3. The offsetting will be subjected to a scale of disallowances expressed as a fraction of the matched positions, as set out in **Table 4** when calculating subject to a second set of disallowance factors.

Table 4: Horizontal Disallowances

<table>
<tr><th>Zones</th><th>Time Band</th><th>Within the Zone</th><th>Between Adjacent Zones</th><th>Between Zones 1 and 3</th></tr>
<tr><td>Zone 1</td><td>0 – 1 month
> 1 – 3 months
> 3 – 6 months
> 6 – 12 months</td><td>40%</td><td rowspan="3">40%

40%</td><td rowspan="3">100%</td></tr>
<tr><td>Zone 2</td><td>> 1 – 2 years
> 2 – 3 years
> 3 – 4 years</td><td>30%</td></tr>
<tr><td>Zone 3</td><td>> 4 – 5 years
> 5 – 7 years
> 7 – 10 years
> 10 – 15 years
> 15 – 20 years
> 20 years</td><td>30%</td></tr>
</table>

5.69 The general risk capital requirement will be the sum of:

Net Position	Net Short or Long Weighted Positions	× 100%
Vertical Disallowances	Matched Weighted Positions[194] in all Maturity Bands	× 10%
Horizontal Disallowances	Matched Weighted Positions within Zone 1	× 40%
	Matched Weighted Positions within Zone 2	× 30%
	Matched Weighted Positions within Zone 3	× 30%
	Matched Weighted Positions Between Zones 1 & 2	× 40%
	Matched Weighted Positions Between Zones 2 & 3	× 40%
	Matched Weighted Positions Between Zones 1 & 3	× 100%

An example of the calculation of general risk is set out in **Example 1.**

Duration Method

5.70 Under the alternative duration method, banking institutions with the necessary capability may use a more accurate method of measuring all their general risk by calculating the price sensitivity of each position separately. Banking institutions which elect to use this method must do so consistently. The mechanics of this method are as follows:

- calculate the price sensitivity of each instrument in terms of a change in interest/profit rates of between 0.8 and 1.5 percentage points for instruments denominated in non-G10 countries' currencies and between 0.6 and 1.0 percentage point for instruments denominated in G10 countries' currencies (refer to **Table 5**) depending on the maturity of the instrument;
- slot the resulting sensitivity measures into a duration-based ladder in the thirteen time bands set out in the second column of **Table 5** and obtain the net position;

[194] The smaller of the absolute value of the short and long positions within each time band.

- subject long and short positions in each time band to a 5% vertical disallowance to capture basis risk in the same manner as per paragraph 5.67; and
- carry forward the net positions in each time band for horizontal offsetting subject to the disallowances set out in **Table 4** in the same manner as per paragraph 5.68.

The market risk capital charge will be the aggregation of the three charges described in paragraph 5.69.

Table 5: Changes in Yield for Financial Instruments Exposed to G10 and Non-G10 Currency Interest/Profit Rate Risk

Zone	Time Bands (Coupon 3% or more)	Time Bands (Coupon less than 3%)	G10 Changes in Yield (%)	Non-G10 Changes in Yield (%)
1	1 month or less	1 month or less	1.00	1.50
	> 1 - 3 months	> 1 - 3 months	1.00	1.50
	> 3 - 6 months	> 3 - 6 months	1.00	1.40
	> 6 - 12 months	> 6 - 12 months	1.00	1.20
2	> 1- 2 years	> 1.0 - 1.9 years	0.90	1.00
	> 2 - 3 years	> 1.9 - 2.8 years	0.80	0.90
	> 3 - 4 years	> 2.8 - 3.6 years	0.75	0.90
3	> 4 - 5 years	> 3.6 - 4.3 years	0.75	0.90
	> 5 - 7 years	> 4.3 - 5.7 years	0.70	0.90
	> 7 - 10 years	> 5.7 - 7.3 years	0.65	0.80
	> 10 - 15 years	> 7.3 - 9.3 years	0.60	0.80
	> 15 - 20 years	> 9.3 - 10.6 years	0.60	0.80
	> 20 years	>10.6 - 12 years	0.60	0.80
		> 12 - 20 years	0.60	0.80
		> 20 years	0.60	0.80

Treatment of Interest/Profit Rate Derivatives, Repo and Reverse Repo Transactions

5.71 The market risk measurement system should include all interest/profit rate derivatives, off-balance sheet instruments, repos and reverse repos in the

trading book which would react to changes in interest/profit rates (for example forward rate agreements (FRAs), other forward contracts, bond futures, interest/profit rate and cross-currency swaps and forward foreign exchange positions). Options can be treated in a variety of ways as described in **Part D.2.5 Treatment of Options.**

5.72 Derivatives should be converted into positions in the relevant underlying and subject to general risk charges. To determine the capital charge under any of the two standardised methods described above, the amounts reported should be the market value of the principal amount of the underlying or of the notional underlying. Treatment of the interest/profit rate derivative positions by product class is described in **Box 1.** A summary on the treatment for interest/profit rate derivatives is set out in **Table 6.**

Table 6: Summary of Treatment of Interest/Profit Rate Derivatives, Repo and Reverse Repos under the Standardised Market Risk Approach

Instrument	Specific Risk*	General Risk
Exchange-Traded Futures/OTC Forwards		
- Malaysian Government debt security	No	Yes, as two positions +
- Foreign sovereigns debt security	Yes^	Yes, as two positions +
- Corporate debt security	Yes	Yes, as two positions +
- Index on interest/profit rates	No	Yes, as two positions +
FRAs, Swaps	No	Yes, as two positions +
Forward Foreign Exchange	No	Yes, as one position in each currency +
Options		Either
- Malaysian Government debt security	No	(a) Simplified Approach:
- Foreign sovereigns debt security	Yes^	Carve out together with the associated hedging positions for general risk only and reflect under **Part D.2.5**;
- Corporate debt security	Yes	Or
- Index on interest/profit rates	No	(b) Delta-Plus Method:
- FRAs, Swaps	No	Include the delta weighted option position into the respective time bands according to its underlying. (Gamma and Vega risk should each receive a separate capital charge and calculated under **Part D.2.5**);
		Or
		(c) Scenario Approach:
		Carve out together with the associated hedging positions for general risk only and reflect under **Part D.2.5**;
		Or
		(d) Internal Models Approach (**Part D.3**)
Repo	No	Yes, as 1 position +
Reverse Repo	No	Yes, as 1 position +

* This refers to the specific risk charge relating to the issuer of the financial instrument. There remains a separate risk charge for counterparty credit risk which is set forth in the credit risk component of this framework.

^ The specific risk capital charge only applies to foreign sovereign debt securities that are rated below AA-

\+ Refer to Box 1 for more details on method of recording the position.

5.73 While interest/profit rate and cross-currency swaps, FRAs, forward foreign exchange contracts and interest/profit rate futures will not be subject to a specific risk charge, they are subjected to counterparty credit risk which is set forth in the credit risk component of this framework. Similar treatment

also applies to futures on an interest rate index (for example 3-month KLIBOR). In the case of contracts where the underlying is a specific debt security/*sukūk*, or an index representing a basket of debt securities/*sukūk*, a specific risk charge will apply.

5.74 All derivative products are subject to general market risk in the same manner as cash positions, with the exception of fully matched positions in identical instruments. The various categories of instruments should be slotted into the maturity ladder and treated according to the rules identified earlier.

5.74(i) A summary of the treatment for credit derivatives in the trading book is set out in **Appendix XXXI**.

BOX 1

Futures and Forward Contracts, including Forward Rate Agreements (FRAs)

These instruments (with the exception of futures or forwards on corporate bonds, corporate bond indices or other corporate securities) are treated as a combination of a long and a short position in a notional government security. The maturity period of futures or FRAs will be the period until delivery or exercise of the contract, plus – where applicable – the life of the underlying instrument. For example, a long position in a June three month interest/profit rate future (taken in April) is to be regarded as a long position in a government security with a maturity of five months and a short position in a government security with a maturity of two months.

In the case of a future or forward on a corporate bond or corporate bond index, positions will be included at the market value of the notional underlying security/portfolio of securities. In the case of foreign currency forward contracts, either a long or a short position in the market value of each underlying currency leg would be recorded in the respective maturity ladder templates capturing the relevant currency interest/profit rate risk.

Swaps

Swaps will be treated as two underlying positions in government securities with relevant maturities. For example, an interest/profit rate swap under which a banking institution is receiving floating-rate interest/profit and paying fixed will be treated as a long position in a floating-rate instrument of maturity equivalent to the period until the next interest/profit fixing and a short position in a fixed-rate instrument of maturity equivalent to the residual life of the swap.

For swaps that pay or receive a fixed or floating interest/profit rate against some other reference price, for example a stock index, the interest/profit rate component should be slotted into the appropriate repricing maturity category, with the equity component being included in the equity framework. The separate legs of cross-currency swaps are to be reported at market value in the relevant maturity ladders for the currencies concerned.

Risk Arising from Repo Transactions

Arising from pledging/selling of securities and receiving cash with an agreement to repurchase securities or repayment of cash at the agreed future date. The classification of repo transactions should be based on the trading book definition, hence it can be classified either as a trading (for example repo to fund trading book positions) or banking book position (for example repo to fund banking book positions).

Trading Book Repo

<u>General Risk</u>

- Arising from short cash position.
- Recording: short the value of the repo (cash leg) based on the remaining maturity of the repo.

<u>Counterparty Credit Risk</u>

- The net exposure arising from the swapping of securities and cash with

the repo counterparty at maturity of the repo.

- Recording: Treated as credit risk under the credit risk component of this framework.

Risk of the Underlying Securities

- Irrespective of whether the underlying security is from the banking or trading book, its respective credit risk or market risk shall remain.

Banking Book Repo

Counterparty Credit Risk

- The net exposure arising from the lending of securities and borrowing cash.
- Recording: Treated as a banking book counterparty credit risk charge under the credit risk component of this framework for repo style transactions.

Risk of the Underlying Securities

- Irrespective of whether the underlying security is from the banking or trading book, its respective credit risk or market risk shall remain.

Risk Arising from Reverse Repo Transactions

Arising from borrowing/buying of securities in exchange for cash with an agreement to resell securities or receive cash at the agreed future date. The classification of reverse repo transactions should be based on the trading book definition, hence it can be classified either as a trading or banking book position.

Trading Book Reverse Repo

General Risk

- Arising from long cash position.
- Recording: long the value of the reverse repo based on the remaining maturity of the reverse repo.

Counterparty Credit Risk

- The net exposure arising from the borrowing/buying of securities in exchange for cash with the reverse repo counterparty at maturity of the reverse repo.

- Recording: Treated as credit risk under the credit risk component of this framework.

Banking Book Reverse Repo

Counterparty Credit Risk

- The net exposure arising from the lending of cash collateralised by securities.
- Recording: Treated as a banking book counterparty credit risk charge under the credit risk component of this framework for reverse repo style transactions.

For the capital treatment for SBBA and reverse SBBA transactions, please refer to **Appendix XIX**.

Options

Three methods (Simplified Approach, Delta-Plus Method and Scenario Approach) are available under **Part D.2.5 Treatment of Options**, on the treatment of interest/profit rate related options. Interest/Profit rate option positions and the underlying transactions will be carved out and capital provided separately for general risk if banking institutions choose to use the simplified and scenario approach. However, if the delta-plus method is selected, the delta-weighted option position will be slotted into the respective time bands according to its underlying together with the other interest/profit rate related instruments. Nevertheless, under the delta-plus method, the Gamma and Vega risks will be separately calculated as described in **Part D.2.5 Treatment of Options**. Banking institutions are also allowed to use Internal Modes Approach under **Part D.3** subject to written approval from the Bank.

Example 1: Calculation of General Risk (Maturity Method) for Interest/Profit Rate Related Financial Instruments

1. Assume that a banking institution has the following positions in its trading book:

i) a Malaysian fixed rate corporate bond, RM13.33 million market value, residual maturity 8 years;
ii) a Malaysian government securities (MGS), RM75 million market value, residual maturity 2 months;
iii) an interest/profit rate swap, RM150 million[195], the banking institution receives floating rate interest/profit and pays fixed, the next interest fixing occurs after 9 months, residual life of the swap 8 years;
iv) a long position in MGS futures of RM60 million[196], maturing in six months time, life of underlying government security 3.5 years; and
v) a Malaysian fixed rate trading book corporate bond, RM50 million market value, residual maturity of 5 years, sold under repo for three months.

2. Table A shows how these positions are slotted into the time bands and are weighted according to the weights given in column 5 of Table 3 (Risk weight for Non-G10 countries currency) of **Part D.2.1 Interest/Profit Rate Risk**. After weighting the positions, the calculation should proceed as follows:

a) The overall net position is -2.12 million (0.05-0.30+1.20+1.62+1.60-6.29 million) leading to a capital charge of RM2.12 million.
b) The vertical disallowance in time bands 1-3 months and 7-10 years has to be calculated and the matched position in these time-bands (the lesser of the absolute values of the added weighted long and added weighted short positions

[195] The position should be reported as the market value of the notional underlying. Depending on the current interest/profit rate, the market value of each leg of the swap (that is the 8 year bond and the 9 month floater) can be either higher or lower than the notional amount. For simplicity, the example assumes that the current interest/profit rate is identical with the one the swap is based on, hence, the market value for both legs are identical.
[196] Similar to interest/profit rate swaps, the market value of each leg should be used.

in the same time-band) are 0.10 and 0.61 million respectively resulting in a capital charge of 10% of 0.71 million = RM0.07million.

c) The horizontal disallowances within the zones have to be calculated. As there are more than one position in zones 1 and 3, a horizontal disallowance need only be calculated in these zones. In doing this, the matched position is calculated as the lesser of the absolute values of the added long and short positions in the same zone and is 0.30 and 1.60 million in zones 1 and 3 respectively. The capital charge for the horizontal disallowance within zone 1 is 40% of 0.30 million = RM0.12 million and 30% of 1.60 million = RM0.48 million in zone 3. The remaining net weighted positions in zones 1 and 3 are +0.95 and -4.69 million respectively.

d) The horizontal disallowances between adjacent zones have to be calculated. After calculating the net position within each zones the following positions remain: zone 1: +0.95 million; zone 2: +1.62 million and zone 3: -4.69 million. The matched position between zones 2 and 3 is 1.62 million (the lesser of the absolute values of the long and short positions between adjacent zones). The capital charge in this case is 40% of 1.62 million = RM0.65 million.

e) The horizontal disallowance between zones 1 and 3 has to be calculated. The matched position between zones 1 and 3 is 0.95 million (the lesser of the absolute values of the long and short positions between zones 1 and 3). The horizontal disallowance between the two zones is 100% of the lower of the matched position which leads to a capital charge of 100% of 0.95 million = RM0.95 million.

3. The total capital charge (RM million) in this example is:

- overall net open position	2.12
- vertical disallowance	0.07
- horizontal disallowance in zone 1	0.12
- horizontal disallowance in zone 3	0.48
- horizontal disallowance between adjacent zones	0.65
- horizontal disallowance between zones 1 and 3	0.95
Total	**4.39**

Table A: Maturity Method of Calculating General Risk of Interest/Profit Rate Related Financial Instruments (RM million)

Time Bands	Zone 1				Zone 2			Zone 3								Total Charge
	Months				Years											
(Coupon 3% or more)	up to 1	> 1 - 3	> 3 - 6	> 6 - 12	> 1 - 2	> 2 - 3	> 3 - 4	> 4 - 5	> 5 - 7	> 7 - 10	> 10 - 15	> 15 - 20	over 20			
(Coupon less than 3%)					> 1 - 1.9	> 1.9 - 2.8	> 2.8 - 3.6	> 3.6 - 4.3	> 4.3 - 5.7	> 5.7 - 7.3	> 7.3 - 9.3	> 9.3 - 10.6	> 10.6 - 12	> 12 - 20	over 20	
Long Position		75 Govt Bond (ii)		150 Swap (iii)			60 Futures (iv)	50 corporate bond* (v)		13.33 corporate bond (i)						
Short Position		50 Repo (Cash) (v)	60 Futures (iv)							150 Swap (iii)						
Assigned Weights (%)	0.00	0.20	0.50	0.80	1.30	1.90	2.70	3.20	4.10	4.60	6.00	7.00	8.00	10.40	16.40	
Overall Net Open Position		+0.05	-0.30	+1.20			+1.62	+1.60		-6.29						**2.12**
Vertical Disallow.		0.10 x 10% = 0.01								0.61 x 10% = 0.06						**0.07**
Horizontal Disallow. 1	0.30 x 40% = 0.12						1.60 x 30% = 0.48									**0.60**
Horizontal Disallow. 2					1.62 x 40% = 0.65											**0.65**
Horizontal Disallow. 3	0.95 x 100% = 0.95															**0.95**
Total General Risk Charge																**4.39**

* General market risk for the underlying corporate bond remains in the trading book.

D.2.2 EQUITY POSITION RISK

5.75 This part sets out the minimum capital standard to cover the risk of equity[197] positions in the trading book. It applies to long and short positions in all instruments that exhibit market behaviour similar to equities. The instruments covered include ordinary shares, whether voting or non-voting, convertible securities that behave like equities, and commitments to buy or sell equity securities. Non-convertible preference shares are to be excluded from these calculations as they are covered under the interest/profit rate risk requirements described in **Part D.2.1 Interest/Profit Rate Risks.** Equity derivatives and off-balance sheet positions such as futures, swaps and options on individual equity or stock indices are also included. Underwriting of equities[198] should be included and regarded as an option instrument.

Specific and General Risk

5.76 The minimum capital standard for equities is expressed in terms of two separately calculated charges for the specific risk of holding a long or short position in an individual equity and for the general risk of holding a long or short position in the market as a whole. The long or short position in the market must be calculated on a market-by-market basis. Hence, a separate calculation has to be carried out for each national market in which the banking institution holds equities.

Specific Risk

5.77 Specific risk is defined as a proportion of the banking institution's sum of the absolute value of all net positions in each individual equity[199] regardless of whether it is net long or net short. Matching opposite position for the same equity issuer may be netted-off. The charge for specific risk is

[197] Includes private commercial enterprise's equity trading activities where the Islamic banking operation has *mushārakah* and/or *muḍārabah* financing.

[198] The underwriter is obliged to purchase equities at the issue price for unsubscribed equities which in effect is equivalent to writing a put option and the issuer as the holder of the put option has the right but not the obligation to sell the equities to the underwriter at the issue price.

[199] Net position in each individual equity refers to the net of short and long exposure to an individual company.

listed in **Table 7**[200]. The Bank however, reserves the right to assign different risk weights to specific exposure in order to better reflect the risk characteristics of the exposure. In this regard, a 0% specific risk weight is assigned to ABF Malaysia Bond Index Fund (ABFM).

General Risk

5.78 General risk will be assessed on the difference between the sum of the longs and the sum of the shorts of all equity positions (that is the overall net position) in an equity market. The *general risk* charge is as provided in **Table 7.**

[200] If the Delta-plus method or the Scenario approach is selected to estimate the general risk of equity options, the specific risk of these positions will be calculated within this part as the multiplication of the delta weighted option underlying position and the risk weight for specific risk as provided in **Table 7**. However, if the Underlying Position approach is adopted, both specific risk and general risk of the equity option will be carved out and provided under **Part D.2.5 Treatment of Options** of paragraphs 5.115 and 5.116.

Table 7: Specific Risk and General Risk Charges for Equities and Equity Derivatives

Instrument	Specific risk	General risk
Equity and/or Equity Derivative (except Options) Positions with the following as Underlying:		
• KLCI equities	8%	8%
• Equities of G10 countries market indices	4%	8%
• Non-index equities of G10 stock exchanges	8%	8%
• All other equities	14%	8%
• Trust funds and Exchange Traded Funds	8%	8%
• KLCI and all market indices	2%	8%
• G10 countries market indices	2%	8%
• Other market indices	2%	8%
• Arbitrage** (Execution Risk)	2%	

Underwriting of Equity

Underlying Position Approach:

General and specific risk for underwriting IPO and rights issue is calculated by carving out the positions and reporting them based on the underlying position approach under **Part D.2.5 Treatment of Options**

Equity Options

1. Simplified Approach:
   This approach applies to limited range of purchase options only. Equity options and associated underlying cash positions are 'carved-out' and subject to separately calculated capital charges that incorporate both general market risk and specific risk under **Part D.2.5 Treatment of Options**; or
2. Delta-Plus Method:
   i. For both specific risk and general risk charge, the delta weighted option position is multiplied with the relevant specific risk and general risk charge as provided above.
   ii. Gamma and Vega risk should each receive a separate capital charge calculated as per **Part D.2.5 Treatment of Options**; or
3. Scenario Approach:
   i. Specific risk is calculated by multiplying the delta weighted position of the option's underlying by the specific risk charge as provided above.
   ii. General risk is calculated by carving out the options position together with its associated hedging positions and reflected under **Part D.2.5 Treatment of Options**; or
4. Internal Models Approach:
   Subject to the Bank's approval upon compliance with **Part D.3**

** Refer to paragraphs 5.81 and 5.82.

Treatment of Equity Derivatives

5.79 Equity derivatives and off-balance sheet positions which are affected by changes in equity and equity index prices should be included in the measurement system[201]. The equity derivatives are to be converted into positions in the relevant underlying and subjected to the following requirements:

- futures and forward contracts relating to individual equities are reported at current market prices;
- futures relating to equity indices are reported either as the current index value times the monetary value of one index point set by the futures exchange (for example, Kuala Lumpur Composite Index Futures (FKLI) is set at RM 50 per index point) or market value of the notional underlying equity portfolio;
- equity swaps are treated as two notional positions[202];
- underwriting of equity IPO position is carved out where capital charge for both specific risk and general risk are provided as described in **Part D.2.5 Treatment of Options - Underlying Position Approach**; and
- equity options and stock index options are treated under one of the four proposed methods in **Part D.2.5 Treatment of Options** that is simplified approach, scenario approach, delta-plus approach or internal models.

The treatment for equity derivatives is summarised in **Table 7**.

Offsetting of Matched Equity Derivative Positions

5.80 Matching equity derivative positions with identical equity underlying position and matching positions in equity derivative contracts of identical

[201] Where equities are part of a forward contract, a future or an option (quantity of equities to be received or to be delivered), any interest/profit rate or foreign currency exposure from the other leg of the contract should be reported as set out in **Part D.2.1 Interest/Profit Rate Risk and Part D.2.3 Foreign Exchange Risk.**

[202] For example, an equity swap in which a banking institution is receiving an amount based on the change in value of one particular equity or stock index and paying a different index will be treated as a long position in the former and a short position in the latter. Where one of the legs involves receiving/paying a fixed or floating interest/profit rate, that exposure should be slotted into the appropriate repricing time band for interest/profit rate related instruments as set out in **Part D.2.1 Interest/Profit Rate Risk**. The stock index should be covered by the equity treatment.

underlying in each market may be fully offset, resulting in a single net short or long position to which the specific and general risk charges will apply. For example, a future in a given equity may be offset against an opposite physical position in the same equity[203]. Similarly, a long and short position of identical equity futures for a particular contract month can be netted off.

Arbitrage

5.81 In the case of the futures-related arbitrage strategies described below, the additional 2% capital charge to reflect divergence and execution risks as described in **Table 7** may be applied to only one index with the opposite position exempt from a capital charge. To qualify, banking institutions must clearly identify that the trade has been deliberately entered into and separately controlled. The strategies may be in the form of:

- banking institution taking an opposite position in exactly the same index at different dates or in different market centres; and/or
- banking institution having an opposite position in contracts at the same date in different but similar indices, subject to supervisory oversight that the two indices contain sufficient common components to justify offsetting.

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

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

However, in such cases, capital charge of 2% is applied on matching gross value of each side of the two positions. This applies even if all of the stocks comprising the index are held in identical proportions. Any excess

[203] The interest/profit rate risk arising out of futures contract, however, should be reported as set out in **Part D.2.1 Interest/Profit Rate Risk**

value of the stocks comprising the basket over the value of the futures contract or excess value of the futures contract over the value of the basket is treated as an open long or short position. An example of how the equity arbitrage works is set out in **Example 2.**

5.83 If a banking institution takes a position in depository receipts against an opposite position in the underlying equity or identical equities in different markets, it may offset the position (that is bear no capital charge) but only on condition that any costs on conversion are fully taken into account.[204]

Example 2: Calculation of Equity Risk for Equity Arbitrage Strategies

Assume that a banking institution has the following equity arbitrage positions in its trading book:

1. Long five March 2008 Nikkei 225 Index Futures contracts at 16,000 **traded at SGX** (Singapore Exchange) and short five March 2008 Nikkei 225 Index Futures contracts at 16,500 **traded at OSE** (Osaka Securities Exchange). The positions are deliberately entered into and managed separately.

Capital charge	=	Risk Charge for Arbitrage Strategies x Number of Contracts x ¥500 (per index point) x Index of March 08 Nikkei 225 contract
	=	2.0% x 5 x ¥500 x 16,500
	=	¥825,000
	=	**RM2,500** (RM/¥: RM3.30 per ¥100)

Note: The foreign exchange rate risk is dealt with in accordance with the part on Foreign Exchange Rate Risk

2. Long five June 07 Kuala Lumpur Composite Index Futures (FKLI) contracts with index at 1000, and short five September 07 FKLI contracts. The positions are deliberately entered into and managed separately.

[204] Any foreign exchange risk arising out of these positions has to be reported as set out in **Part D.2.3 Foreign Exchange Risk**

Capital charge	=	Risk Charge for Arbitrage Strategies x Number of Contracts x RM50 (per index point) x Index of June 07 contract
	=	2.0% x 5 x RM50 x 1000
	=	**RM5,000**

3. Long a basket of KLCI equity worth RM1.1 million with weighted composition of 90% of the index broken down into notional components; and short ten June 07 FKLI contracts worth RM1.0 million. The transactions are deliberate entered into and separately controlled.

   Under this arbitrage strategy, there is an excess value (unmatched position) of RM100,000 over the value of the contracts. The excess value would be subjected to capital charge for both general and specific risks.

Capital charge	=	[(2% of the gross value of basket of stocks and futures contract] + [Unmatched Position x (Specific + General Risk Charge)]
	=	[(2.0% x RM2.1million)] + [(RM100,000) x (8%+8%)]
	=	RM42,000 + RM16,000
	=	**RM58,000**

D.2.3 FOREIGN EXCHANGE RISK (INCLUDING GOLD AND SILVER POSITIONS)

5.84 This part sets out the minimum capital standard to cover the risk of holding or taking positions in foreign currencies[205] including gold and silver. Taking on foreign exchange positions may also expose a banking institution to interest/profit rate risk (for example, in forward foreign exchange contracts). In such a case, the relevant interest/profit rate positions should be included in the calculation of interest/profit rate risk described in **Part D.2.1 Interest/Profit Rate Risks.**

5.85 Under the standardised approach, two steps are needed to calculate the capital requirement for foreign exchange risk. The first is to measure the exposure in a single currency position (that is the net open position of a singe currency). The second is to measure the risks inherent in a banking institution's mix of net long and short positions in different currencies (that is the total net long and total net short position in foreign currencies).

5.86 The capital charge will be 8% of the higher of the total net long or total net short foreign currency position. The respective net position in gold and silver is treated on a stand alone basis and applied a capital charge of 8%.

5.87 Where there is physical trading of gold and silver, an additional capital charge of 3% is applied on the total gross long and short position respectively to account for execution risk.

The Treatment of Structural Positions

5.88 While matched foreign currency asset and liability positions will protect a banking institution against loss from movements in exchange rates, this will not necessarily protect its capital adequacy ratios. This is due to higher RWA for its foreign assets arising from appreciation of foreign exchange rate. By maintaining a *structural* net long position in the foreign currency,

[205] Includes private commercial enterprise's FX trading activities where the Islamic banking operation has *mushārakah* and/or *muḍārabah* asset exposure.

the gain arising from revaluation of the net long position will buffer the increase in RWA resulting from the rise in the value of foreign currency assets.

5.89 Any structural foreign currency positions which a banking institution has deliberately taken to hedge partially or totally against the adverse effect of the exchange rate on its capital adequacy ratios may be excluded from the calculation of net open currency positions, subject to the following conditions :

- the positions must be of non-dealing nature;
- the positions do no more than protect the banking institution's capital adequacy ratio; and
- the exclusion of the positions are approved by ALCO/Risk Committee, or other approving authority delegated by the board, and must be applied consistently throughout the life of the assets.

Measuring the Exposure in a Single Currency

5.90 Banking institution's net open position in each currency (excluding gold and silver) should be calculated by aggregating the following positions:

- net on-balance sheet position[206] (that is all foreign currency asset items less all foreign currency liability items, for example currency and notes, trade bills, government and corporate bonds, loans/financing and deposits, foreign currency accounts and accrued interest/income, denominated in the foreign currency in question)[207];
- net forward position (that is present value of all amounts to be received less present value of all amounts to be paid under unsettled spot transactions, forward foreign exchange transactions, including currency futures, the principal on currency swaps position and interest/profit rate

[206] Structural positions which fulfil conditions set out in **Part D.2.3 Foreign Exchange Risk** would be excluded from the computation.

[207] Interest/profit and other income accrued (that is earned but not yet received) should be included as a position. Accrued expenses should also be included.

transactions such as futures, swaps etc. denominated in a foreign currency)[208];

- guarantees and contingencies (exclude underwriting of equity IPOs which are captured as options and treated under **Part D.2.5 Treatment of Options**) that are certain to be called and are likely to be irrecoverable;
- any other item representing a profit or loss in foreign currencies; and
- the net delta-based equivalent of the total book of foreign currency options[209].

5.91 Currency pairs subject to a binding inter-governmental agreement linking the two currencies may be treated as one currency[210].

5.92 Positions in gold and silver are measured in terms of the standard unit of measurement which is then converted at reporting date spot exchange rate into ringgit[211] .

The Treatment of Interest/Profit, Other Income and Expenses in Foreign Currency

5.93 Interest/profit accrued (that is earned but not yet received) should be included as a position. Accrued expenses should also be included. Unearned but expected future interest/profit and anticipated expenses may be excluded except when the amounts are certain and banking institutions

---

208 Forward currency positions could be valued in the following ways:
(a) Present values of each forward foreign currency position using the interest/profit rate of the foreign currency and translated at current spot exchange rate to get the ringgit equivalent; or
(b) Use forward exchange rates to translate the forward foreign currency leg into ringgit equivalent before discounting it by ringgit interest/profit rates; or
(c) Multiply the foreign currency forward leg by current spot exchange rate without present valuing.
Treatments (a) and (b) are preferred. Nevertheless, treatment (c) which is a simplified but relatively inaccurate method may be used by banking institutions with small foreign exchange positions and do not possess the systems to conduct present value calculations.

209 Applicable to institutions which uses the Delta-plus method of treating options position. Subject to separately calculated capital charges for Gamma and Vega as described in **Part D.2.5 Treatment Of Options**; alternatively, options and their associated underlying may be subject to one of the other methods described in **Part D.2.5 Treatment Of Options**.

210 For example, inter-governmental agreements apply to Singapore and Brunei dollars.

211 Where gold/silver is part of a forward contract (the quantity of gold/silver to be received or to be delivered), any interest/profit rate or foreign currency exposure from the other leg of the contract should be reported as set out in **Part D.2.1 Interest/Profit Rate Risks**.

have taken the opportunity to hedge them. If banking institutions include future income/expenses, the treatment should apply on a consistent basis, and not restricted to those expected future flows that would reduce position.

Measuring the Foreign Exchange Risk in a Portfolio of Foreign Currency Positions

5.94 The net position of the combined trading and banking book in each foreign currency is converted at spot rates (as at date of reporting) into the reporting currency (Malaysian ringgit). The overall net open position is measured by aggregating:

a) the sum of the net short positions or the sum of the net long positions, whichever is the greater; with

b) the net position (short or long) in gold and silver, regardless of whether it is positive or negative.

5.95 The capital charge will be 8% of the overall net open position (refer to the example below).

Example of the Standard Measure of Foreign Exchange Risk

	JPY	HKD	GBP	SGD	USD	GOLD
Step 1	+50	+100	+150	-20	-180	-35
Step 2	+300			-200		-35

The capital charge for foreign exchange risk would be 8 per cent of the higher of either the net long currency positions or the net short currency positions (300) and of the net position in gold (35) = 335 x 8% = 26.8.

D.2.4 COMMODITIES RISK

5.96 This part establishes a minimum capital standard to cover the price risk of taking exposure in commodities[212], including precious metals, but excluding gold and silver (which are treated as a foreign currency according to the methodology set out in **Part D.2.3 Foreign Exchange Risk.** A commodity is defined as a physical product which is or traded on a secondary market, for example agricultural products, minerals (including oil) and precious metals.

5.97 The price risk in commodities is often more complex and volatile than that associated with currencies and interest/profit rates. Commodity markets may also be less liquid than those for interest/profit rates and currencies and, as a result, changes in supply and demand can have a more dramatic effect on price and volatility.[213] These market characteristics can make price transparency and the effective hedging of commodities risk more difficult.

5.98 Banking institutions involved in commodity derivatives are exposed to the following risks:

- directional risk (the risk arising from a change in the spot price);
- basis risk (the risk that the relationship between the prices of similar commodities alters through time);
- interest/profit rate risk (the risk of a change in the cost of carry for forward positions and options); and
- forward gap risk (the risk that the forward price may change for reasons other than a change in interest/profit rates).

[212] All commodity derivatives and off-balance-sheet positions which are affected by changes in commodity prices should be included. This includes commodity risk arising from *Salam* contracts and private commercial enterprise's commodity trading activities where the Islamic banking operation has *mushārakah* and/or *muḍārabah* exposure.

[213] Banking institutions need also to guard against the risk that arises when the short position falls due before the long position. Owing to a shortage of liquidity in some markets it might be difficult to close the short position and the banking institution might be squeezed by the market.

In addition banking institutions are exposed to counterparty credit risk on over-the-counter derivatives, but this is captured by the credit risk component of this framework. The funding of commodities positions may well expose a banking institution to interest/profit rate or foreign exchange risk and the relevant positions should be included in the measure of interest/profit rate and foreign exchange risk described in **Part D.2.1 Interest/Profit Rate Risk** and **D.2.3 Foreign Exchange Risk.**[214]

5.99 Under the standardised approach, commodities risk is measured using either Simplified Approach or Maturity Ladder Approach. Both the Simplified Approach and the Maturity Ladder Approach are appropriate only for banking institutions which, in relative terms, conduct only a limited amount of commodities business. Major traders would be expected over time to adopt the internal model approach subject to the requirements set out in the **Part D.3 Internal Models Approach.**

5.100 Under the Simplified Approach and the Maturity Ladder Approach, long and short positions in each commodity may be reported on a net basis[215] for the purposes of calculating open positions. Positions in different commodities will not be offsettable in this manner. However, the commodities can be considered as offsettable if they are ***similar***[216] in nature and exhibit a minimum correlation of 0.9 between the price movements can be clearly established over a minimum period of one year. Banking institution wishing to base its calculation of capital charges for commodities on correlations would have to satisfy the Bank of the accuracy of the method which has been chosen and obtain its prior approval.

---

[214] Where a commodity is part of a forward contract (quantity of commodities to be received or to be delivered), any interest/profit rate or foreign currency exposure from the other leg of the contract should be reported as set out in **Part D.2.1 Interest/Profit rate Risk** and **Part D.2.3 Foreign Exchange Risk (Including Gold and Silver Positions)**. Positions which are purely stock financing (that is a physical stock has been sold forward and the cost of funding has been locked in until the date of the forward sale) may be omitted from the commodities risk calculation although they will be subject to interest/profit rate and counterparty risk requirements.

[215] Banking institutions may exclude long and short positions in identical underlying commodities.

[216] For example, CBOT Mini-sized *Gold* vs. 100oz *gold*; but not Mini-sized *Silver* vs. Mini-sized *Gold.*

Simplified Approach

5.101 In calculating the capital charges for directional risk, banking institutions must express each commodity position (spot plus forward) in terms of the standard unit of measurement (barrels, kilos, grams etc.). The net position in each commodity is then converted at current spot rates into Malaysian ringgit. The capital charge will equal 15% of the net position, long or short, in each commodity.

5.102 In order to protect banking institution against basis risk, interest/profit rate risk and forward gap risk, the capital charge for each commodity will be subjected to an additional capital charge equivalent to 3% of the banking institution's gross positions, long plus short, in that particular commodity. In valuing the gross positions in commodity derivatives for this purpose, banking institutions should use the current spot price.

Maturity Ladder Approach

5.103 In calculating the capital charge under this approach, banking institutions must express each commodity position (spot plus forward) in terms of the standard unit of measurement (barrels, kilos, grams etc.). The net position in each commodity will then be converted at current spot rates into Malaysian ringgit.

5.104 Subsequently, in order to capture forward gap and interest/profit rate risk within a time-band (which, together, are sometimes referred to as curvature/spread risk), matched long and short positions in each time-band will carry a capital charge. The methodology is similar to that used for interest/profit rate related instruments as set out in **Part D.2.1 Interest/Profit Rate Risk**. Positions in the separate commodities (expressed in terms of the standard unit of measurement) will first be entered into a maturity ladder while physical stocks should be allocated to the first time-band. A separate maturity ladder will be used for each

commodity as defined in paragraph 5.100.[217] For each time-band, the sum of short and long positions which are matched will be multiplied by the appropriate spread rate for that band (as set out in Table 8 below).

Table 8: Time-Bands and Spread Rates

Time-Band	Spread Rate
0-1 month	1.5%
> 1-3 months	1.5%
> 3-6 months	1.5%
> 6-12 months	1.5%
> 1-2 years	1.5%
> 2-3 years	1.5%
> 3 years	1.5%

5.105 The residual net positions from nearer time-bands may then be carried forward to offset exposures in time-bands that are further out. However, recognising that such hedging of positions among different time-bands is imprecise, a surcharge equal to 0.6% of the net position carried forward will be added in respect of each time-band that the net position is carried forward. The capital charge for each matched amount created by carrying forward net positions is calculated in accordance with paragraph 5.104. At the end of this process, banking institution would either be in long or only short positions, to which a capital charge of 15% is used to account for directional risk. An example of how the maturity ladder approach works is set out in **Example 3.**

5.106 All commodity derivatives and off-balance-sheet positions which are affected by changes in commodity prices fall under this measurement framework. This includes commodity futures, commodity swaps, and

[217] For markets which have daily delivery dates, any contracts maturing within ten days of one another may be offset.

options where the 'delta plus' method[218] is used (see **Part D.2.5 Treatment of Options)**. To calculate the risk, commodity derivatives should be converted into notional commodities positions and assigned to maturities as follows:

- futures and forward contracts relating to individual commodities should be incorporated in the measurement system as notional amounts of barrels, kilos etc. and should be assigned a maturity with reference to expiry date;
- commodity swaps where one leg is a fixed price and the other the current market price should be incorporated as a series of positions equal to the notional amount of the contract, with one position corresponding with each payment on the swap and slotted into the maturity ladder accordingly. The positions would be long positions if the banking institution is paying fixed and receiving floating, and short positions if the banking institution is receiving fixed and paying floating;[219] and
- commodity swaps where the legs are in different commodities are incorporated in the relevant maturity ladder.

Models for Measuring Commodities Risk

5.107 Subject to the Bank's written approval, banking institutions may adopt the Internal Models Approach as set out in **Part D.3**. It is essential that models used capture material risks identified in paragraph 5.98. It is also particularly important that models take proper account of market characteristics – notably delivery dates and the scope provided to traders to close out positions.

5.108 Under the models approach banking institutions may offset long and short positions in different commodities to a degree which is determined by

[218] For banking institutions using other approaches to measure options risk, all options and the associated underlyings should be excluded from both the maturity ladder approach and the simplified approach.

[219] If one of the legs involves receiving/paying a fixed or floating interest/profit rate, that exposure should be slotted into the appropriate repricing maturity band in the maturity ladder covering interest/profit rate related instruments.

empirical correlations, in the same way as a limited degree of offsetting is allowed, for instance, between interest/profit rates in different currencies.

Example 3: Maturity Ladder Approach for Commodities Risk

1. Assume all positions are in the same commodity as defined in paragraph 5.100 and converted at current spot rates into ringgit.

Table B

Time Band	Position (RM)	Spread Rate	Capital Calculation	RM
0-1 month		1.5%		
> 1-3 months		1.5%		
> 3-6 months	Long 800 Short 1000	1.5%	800 long + 800 short (matched) x 1.5% = 200 short carried forward to 1-2 years, capital charge: 200 x 2 x 0.6% =	24 2.4
> 6-12 months		1.5%	*	
> 1-2 years	Long 600	1.5%	200 long + 200 short (matched) x 1.5% = 400 long carried forward to over 3 years, capital charge: 400 x 2 x 0.6% =	6 4.8
> 2-3 years		1.5%	*	
> 3 years	Short 600	1.5%	400 long + 400 short (matched) x 1.5% = Net position: 200, Capital charge: 200 x 15% =	12 30
			Total Capital Charge	79.2

- The net position in the previous bucket is carried forward to the next bucket since no offset could be done in this bucket.

2. Assume all positions are in crude palm oil (CPO):

(a) A short position in forward contract of 15,000 tonne of CPO maturing in six months' time.

(b) Swap position on 10,000 tonne notional amount of CPO, the banking institution receives spot price and pays fixed price. The next payment date occurs in 2 months' time (quarterly settlement) with residual life of 11 months.

First Step

Convert the positions at current spot rates (assuming current spot rate is RM2,500 per tonne).

(a) 15,000 tonne X RM2,500 = RM37.5 million

(b) 10,000 tonne X RM2,500 = RM25.0 million

Second Step

Slot the position in Malaysian ringgit into the maturity ladder accordingly:

(a) Forward contract in "3-6 months" time-band as short position.

(b) Swap position in several time-bands reflecting series of positions equal to notional amount of the contract. Since the banking institution is paying fixed and receiving spot, the position would be reported as a long position. The payments occur (and is slotted accordingly in the respective time-bands) as follows:

- First payment : month 2 (next payment date)
- Second Payment : month 5
- Third payment : month 8
- Final payment : month 11 (end of life of the swap)

Table C

Time Band	Position (RM '000)	Spread Rate	Capital Calculation	RM '000
0-1 month		1.5%		
1-3 months	Long 25,000	1.5%	25,000 long carried forward to '1-3 months', capital charge: 25,000 x 0.6% =	1,500
3-6 months	Long 25,000 Short 37,500	1.5%	37,500 long + 37,500 short (matched) x 1.5% = Balance of 12,500, capital charge: 12,500 x 15% =	1,125 1,875
6-12 months	Long 25,000 Long 25,000	1.5%	Capital charge: 50,000 x 15% =	7,500
			Total Capital Charge	12,000

D.2.5 TREATMENT OF OPTIONS

5.109 Options risks derived from banking institution's underwriting business shall be subjected to options treatment under the Underlying Positions Approach as detailed in this Part. Under this approach, underwriting of equity and debt activities are subjected to separate capital charges that incorporate both specific and general risk. The capital charge numbers are then added to the capital charges of other risk categories.

5.110 For activities involving options other than underwriting, there are four approaches available for measuring options related risks namely; the simplified, delta-plus, scenario and internal models approaches. Banking institutions which are exposed to a limited range of purchased options are allowed to use the simplified approach. Banking institutions which also write options will be expected to use either the delta-plus approach or scenario approach. The use of internal model approaches would require banking institutions to obtain prior approval from the Bank. Banking institutions with significant options trading activities will be expected to use a more sophisticated approach.

Underlying Position Approach

5.111 Banking institutions whose option risk is from underwriting of equity IPO, rights issues and debt securities/*sukūk*, may use the underlying position approach to estimate the required capital charge for these transactions on a trade-by-trade basis, as described below:

Table 9: Underlying Position Approach: Capital Charges	
Position	**Treatment**
Underwriting of equity type instrument; IPO and rights issue	The capital charge will be the amount of equity in the underwriting agreement which the banking institution is committed to underwrite[220] multiplied by the sum of specific risk and general risk weights as defined in **Table 7** of **Part D.2.2 Equity Position Risk**. The resultant amount is then multiplied by 50%, the conversion factor which estimates the pick-up probability. The recognition period for the underwriting equity risk begins from the date when the underwriting agreement is signed until the date of issuance. Equity positions held post-issuance date would be treated as per **Part D.2.2 Equity Position Risk.**
Underwriting of debt instruments/ *sukūk*	The amount of debt/*sukūk* to be raised in the underwriting agreement in which the banking institution is committed to underwrite[220], multiplied by 50%, the conversion factor which estimates the pick-up probability. The resultant figure will be incorporated into **Part D.2.1 Interest/Profit Rate Risk** to calculate the capital charge for general risk. For specific risk charge, the same resultant figure is multiplied by the specific risk charge stipulated in **Table 2** in **Part D.2.1 Interest/Profit Rate Risk** of the framework. The recognition period for the underwriting of debt instruments/*sukūk* begins from the date when the underwriting agreement is signed until the date of issuance[221]. Debt/*Sukūk* positions held post-issuance date would be treated as per Interest/Profit Rate Risk described in **Part D.2.1**

[220] Underwriting commitments can be netted off against sell down (back-to-back) arrangements established with unrelated parties, where the arrangement is unconditional, legally binding and irrevocable, and where the banking institution has no residual obligation to pick up the purported sell down portion.

[221] In most cases of underwriting of short-term debt/*sukūk* such as commercial papers, given that the returns are usually based on cost of funds/expected returns to investors plus a spread, where the cost of funds/expected returns to investors is determined one or two days before issuance, the real exposure to the institutions arising from the underwriting agreement is more of the credit risk of the issuer rather than an interest/profit rate fluctuation risk. As such, for specific risk, the recognition period for underwriting of commercial papers/short term debts papers/*sukūk* begins from the date when the underwriting agreement is signed until the date of issuance whilst for general risk, the recognition period for underwriting of commercial papers/short term debts/*sukūk* begins from the

5.112 To illustrate how the calculation would work in the case of underwriting equities, assume an institution underwrites RM2 million in shares of a non KLCI equity at issue price of RM2.00 each. The capital charge for a non KLCI equity is 22% (that is 14% for specific risk and 8% for general risk). The capital charge would amount to RM 220,000 (RM 2 million x 22% x 50%).

Simplified Approach

5.113 Only banking institutions which handle a limited range of purchased options are allowed to use the simplified approach set out in Table 10 for particular trades. As an example of how the calculation would work, if a holder of 100 KLCI shares currently valued at RM10 each holds an equivalent put option with a strike price of RM11, the capital charge would be: RM1,000 x 16% (that is 8% specific plus 8% general market risk) = RM160, less the amount the option is in the money (RM11 - RM10) x 100 = RM100, that is the capital charge would be RM60. A similar methodology applies for options whose underlying is a foreign currency, an interest rate related instrument or a commodity.

date a rate is fixed (for example, *sukūk murabahah)* until the date of issuance. In the event that market practice changes or in the case of underwriting of debt instruments which assumes characteristics of interest/profit rate options, these positions should be reflected accordingly. An illustration on the treatment for such underwriting exposures is provided in **Appendix XXX**.

Table 10: Simplified Approach : Capital Charges

Position	Treatment
Long cash and Long put Or Short cash and Long call	The capital charge will be the market value of the underlying security[222] multiplied by the sum of specific and general market risk charges[223] for the underlying less the amount the option is in the money (if any) bounded at zero[224]
Long call Or Long put	The capital charge will be the lesser of: (i) the market value of the underlying security multiplied by the sum of specific and general market risk charges[208] for the underlying; or (ii) the market value of the option[225]

Delta-Plus Method

5.114 Banking institutions which write options may be allowed to include delta-weighted option positions within the standard method set out in Part D.2226. Such options should be reported as a position equal to the sum of the market values of the underlying multiplied by the sum of the values of the deltas. However, since delta does not cover all risks associated with option positions, banking institutions are also required to measure Gamma (which measures the rate of change of delta) and Vega (which measures the sensitivity of the value of an option with respect to a change in volatility) in order to calculate the total capital charge.

5.115 Delta-weighted positions with debt securities/*sukūk* or interest/profit rates as the underlying will be slotted into the interest rate time bands, as set out

222 In some cases such as foreign exchange, it may be unclear which side is the 'underlying security'; this should be taken to be the asset which would be received if the option were exercised. In addition the nominal value should be used for items where the market value of the underlying instrument could be zero, for example, caps and floors, swaptions etc.

223 Some options (for example, where the underlying is an interest/profit rate, a currency or a commodity) bear no specific risk but specific risk will be present in the case of options on certain interest/profit rate related instruments (e.g. options on a corporate debt security or corporate bond index; see **Table 2**, **Part D.2.1 Interest/Profit Rate Risk** for the relevant capital charges) and for options on equities and stock indices (see **Table 7**, **Part D 2.2 Equity Position Risk**). The charge under this measure for currency options will be 8% and for options on commodities 15%.

224 For options with a residual maturity of more than six months the strike price should be compared with the forward, not current, price. A banking institution unable to do this must take the in the money amount to be zero.

225 Where the position does not fall within the trading book (that is options on certain foreign exchange or commodities positions not belonging to the trading book), it may be acceptable to use the book value instead.

226 Delta measures the sensitivity of an option's value to a change in the price of the underlying asset.

in **Part D.2.1 Interest/Profit Rate Risk**. Similar to other derivative transactions, a two-legged approach is used, which requires one entry at the time the underlying contract takes effect and a second entry, at the time the underlying contract matures. For instance, a bought call option on a June three month interest rate future will in April be considered, on the basis of its delta-equivalent value, a long position with a maturity of five months and a short position with a maturity of two months[227]. The written option will be similarly slotted as a long position with a maturity of two months and a short position with a maturity of five months. Floating-rate instruments with caps or floors will be treated as a combination of floating-rate securities and a series of European-style options. For example, the holder of a three-year floating-rate bond indexed to 6-month KLIBOR with a cap of 15% will be treated as:

- a debt security that reprices in six months; and
- a series of five written call options on a FRA with a reference rate of 15%, each with a negative sign at the time the underlying FRA takes effect and a positive sign at the time the underlying FRA matures.

5.116 The capital charge for options with equities as the underlying assets are based on the delta-weighted positions which will incorporate the measure of market risk described in **Part D.2.2 Equity Position Risk.**

5.117 The capital charge for options on foreign exchange is based on the delta-weighted position which will incorporate measurement of the exposure for the respective currency position as described in **Part D.2.3 Foreign Exchange Risk.**

5.118 The capital charge for options on commodities is based on simplified or the maturity ladder approach set out in **D.2.4 Commodities Risk**. The

[227] A two month call option on a bond future where delivery of the bond takes place in September would be considered in April as being a long position in the bond and a short position in the five months deposit, both positions being delta-weighted.

delta-weighted positions will be incorporated in one of the measures described under that part.

5.119 In addition to the above capital charge arising from delta risk, there will be further capital charges for Gamma and for Vega risk. Banking institutions using the delta-plus method will be required to calculate the Gamma and Vega for each option position separately.

5.120 The capital charges for Gamma risk should be calculated in the following way:

$$\textit{Gamma impact} = \tfrac{1}{2} \times \text{Gamma} \times (\text{VU})^2$$

where VU denotes the variation in the price of the underlying of the option.

VU will be calculated as follows:

- for interest/profit rate options, the market value of the underlying should be multiplied by the risk weights set out in **Table 3** of **D.2.1 Interest/Profit Rate Risk;**
- for options on equities and equity indices, the market value of the underlying should be multiplied by the equity general risk charge set out in **Table 7** of **Part D.2.2 Equity Position Risk;**
- for options on foreign exchange, the market value of the underlying multiplied by 8 per cent; and
- for options on commodities, the market value of the underlying should be multiplied by 15%.

5.121 For the purpose of calculating the Gamma impact the following should be treated as *the same underlying*:

- interest/profit rates[228], each time band as set out in **Table 3** of **Part D.2.1 Interest/Profit Rate Risk;**
- equities and stock indices, each national market; and
- foreign currencies, each currency pair.

[228] Positions have to be slotted into separate maturity ladders by currency.

- commodities, each individual commodities.

5.122 Each option on the same underlying will have a Gamma impact that is either positive or negative. These individual Gamma impacts are aggregated, resulting in a net Gamma impact for each underlying which is either positive or negative. Only net Gamma impacts that are negative will be included in the capital calculation.

5.123 The total Gamma capital charge will be the sum of the absolute value of the net negative Gamma impacts as calculated above.

5.124 To calculate *Vega risk,* banking institutions must multiply the Vega for each option by a 25% proportional shift of the option's current volatility. The results are then summed across each underlying. The total capital charge for Vega risk is calculated as the sum of the absolute value of Vega across each underlying.

5.125 An illustration of the use of the Delta-plus method is provided in **Example 4.**

Scenario Approach

5.126 Banking institutions will also have the right to base the market risk capital charge for options portfolios and associated hedging positions using the *scenario matrix analysis*. This will be accomplished by specifying a fixed range of changes in the option portfolio's risk factors (that is underlying price/rate and volatility) and calculating changes in the value of the option portfolio and its associated hedging positions at various points along this matrix. To calculate the capital charge, banking institution has to revalue the option portfolio using matrices for simultaneous changes in the option's underlying rate or price and in the volatility of that rate or price. A different matrix will be set up for each individual underlying position. In the case of interest/profit rate options, an alternative method is permitted for banking institutions to base the calculation on a minimum of six sets of time bands.

When using this method, not more than three of the time bands (as defined in **Table 5, Part D.2.1 Interest/Profit Rate Risk**) should be combined into any one set.

5.127 The options and related hedging positions will be evaluated over a specified range above and below the current value of the underlying - this defines the first dimension of the matrix. The range for changes in interest/profit rates is consistent with the assumed changes in yield in **Table 5** of **Part D.2.1 Interest/Profit Rate Risk.** Banking institutions using the alternative method for interest/profit rate options set out in the previous paragraph should use, for each set of the time bands, the highest of the assumed changes in yield, applicable to the group to which the time bands belong[229]. The other ranges are the equity general risk charge stipulated in **Table 7** for equities, and ± 8 per cent for foreign exchange, gold and silver, and ± 15% for commodities. For all risk categories, at least seven price shifts (including the current observation) should be used to divide the range into equally spaced intervals.

5.128 The second dimension of the matrix entails a change in the volatility of the underlying rate or price. A single change in the volatility of the underlying rate or price equal to a proportional shift in volatility of ±25 per cent is expected to be sufficient in most cases. As circumstances warrant, however, the Bank may require that a different change in volatility be used and/or that intermediate points on the matrix be calculated.

5.129 After calculating the matrix, each cell should contain the net profit or loss of the option and the underlying hedge instrument. The capital charge for each underlying will then be calculated as the largest loss contained in the matrix.

[229] If, for example, in the case of options involving G10 currency interest/profit rate risk, where the time bands "> 3 to 4" years, "> 4 to 5" years and "> 5 to 7" years are combined, the highest assumed change in yield of these three bands would be 0.75 percentage point.

5.130 The application of the scenario method by any specific banking institution will be subjected to supervisory consent, particularly with regard to the precise way that the analysis is constructed.

5.131 An illustration of the use of the Scenario Approach is provided in **Example 5.**

Example 4: Delta-Plus Methods for Options

A. A Single Stock Option

1. Assume a banking institution has a European short call option to sell 1000 units of a KLCI stock with an exercise price of RM45 and a market value (spot price) of the underlying 12 months from the expiration of the option at RM50; a risk-free interest rate at 8% per annum, and volatility at 20%. The current unit delta for this position is according to the Black-Scholes formula -0.848 (that is the price of the option changes by -0.848 if the price of the underlying moves by RM1). The unit Gamma is -0.0235 (that is the delta changes by -0.0235, from -0.848 to -0.872, if the price of the underlying moves by RM1). The Gamma is (-0.0235 × 1,000) = -23.55. The current value of the option is RM9.328 × 1,000 = RM9,328.

2. The market risk capital charge for the single stock option is the summation of:
   (i) Specific Risk and General Risk on delta-weighted position incorporated in **Part D.2.2 Equity Position Risk**; and
   (ii) Gamma and Vega risks charge provided under **Part D.2.5 Treatment of Options**.

Specific Risk and General Risk on delta-weighted position of equity options which will be incorporated in Part D.2.2 Equity Position Risk

3. To compute the specific risk and general risk on delta-weighted position of the stock option position, the following steps should be taken:

   a) The first step under the delta-plus method is to calculate the delta-weighted option position. This is accomplished by multiplying the market value of 1 unit of underlying or spot price, the number of units to be sold and the value of the delta

   $$50 \times 1{,}000 \times (-0.848) = -\text{RM}42{,}400.$$

   The delta-weighted position then has to be incorporated into the framework described in **Part D.2.2 Equity Position Risk**.

   b) The specific risk for the stock option will be the multiplication of the delta-weighted position and the specific risk weight of the underlying equity (KLCI stock specific risk weight = 8%, refer to **Table 7** of **Part D.2.2 Equity Position Risk**). Hence, the capital charge for specific risk will be:

   $$-\text{RM}42{,}400 \times 0.08 = \textbf{RM3,392}$$

   c) The delta risk charge will be calculated by incorporating the delta-weighted option position together with the other net equity positions generated in **Part D.2.2 Equity Position Risk**. Assuming that no other positions exist, the delta risk of the stock option is calculated as the multiplication of the delta-weighted position and the 8% general risk weight accorded to equities. Hence, the capital charge for general risk is calculated as:

   $$-\text{RM}42{,}400 \times 0.08 = \textbf{RM3,392}$$

   The total capital charge for specific risk and general risk on delta-weighted position which should be reflected in **Part D.2.2 Equity Position Risk** will be: **RM6,784** (that is 3,392 + 3,392).

Gamma and Vega Risks carved out to be provided under Part D.2.5 Treatment of Options

4. Under the delta-plus method, the capital charges for Gamma and Vega risk will be calculated as follows:

a) The capital charge for Gamma, only negative gamma impact should be included and has to be calculated according to the formula set out in paragraph 5.120 in **Part D.2.5 Treatment of Options**:

½ × Gamma × (market value of 1 unit of the underlying or spot price × 0.08)^2

½ × (23.55) × (50 × 0.08) ^{2} = **RM188**

b) The capital charge for Vega has to be calculated separately. The assumed current (implied) volatility is 20%. As an increase in volatility carries a risk of loss for a short call option, the volatility has to be increased by a relative shift of 25%. This means that the Vega capital charge has to be calculated on the basis of a change in volatility of 5 percentage points from 20% to 25% in this example. According to the Black-Scholes formula used here, the unit Vega equals 11.77. Thus a 1% or 0.01 increase in volatility increases the value of the option by 0.1177 Accordingly, a change in volatility of 5 percentage points would increase the value by:

5 × 0.1177 × 1,000 = **RM589**

which is the capital charge for Vega risk.

The total capital charge for Gamma and Vega risk which should be disclosed in **Part D.2.5 Treatment of Options** under the Delta-plus method will be **RM777** (that is 188 + 589).

5. The total market risk capital charge for 1,000 units of a single stock call option sold, with the stock price of RM50, is **RM7,561** (that is 6,784 + 777).

B. A portfolio of Foreign Exchange Options

6. Assume a banking institution has a portfolio of options with the following characteristics:

Option	Currency Pair	Nominal amount	Market Value of 1 unit of Underlying (Spot Price)	Market Value of 1 unit of Underlying (RM)	Market Value of Underlying (RM)
1	USD/RM	USD100,000	3.132	RM3.132	313,200
2	USD/RM	USD600,000	3.132	RM3.132	1,879,200
3	USD/RM	USD200,000	3.132	RM3.132	626,400
4	USD/RM	USD300,000	3.132	RM3.132	939,600
5	GBP/JPY	GBP100,000	131.806	GBP1 = JPY131.806 * 0.0374586968 = RM4.937	493,700
6	GBP/JPY	GBP50,000	131.806	RM4.937	246,850
7	GBP/JPY	GBP75,000	131.806	RM4.937	370,275

Option	Currency Pair	Market Value of Underlying (RM)	Unit Delta	Unit Gamma	Gamma (RM)	Unit Vega	Assumed volatility (%)
1	USD/RM	313,200	-0.803	0.0018	564	1.84	5
2	USD/RM	1,879,200	-0.519	-0.0045	-8,456	-3.87	20
3	USD/RM	626,400	0.182	-0.0049	-3,069	-0.31	20
4	USD/RM	939,600	0.375	0.0061	5,732	-4.97	10
5	GBP/JPY	493,700	-0.425	0.0065	3,209	5.21	10
6	GBP/JPY	246,850	0.639	-0.0016	-395	-4.16	7
7	GBP/JPY	370,275	0.912	0.0068	2,518	3.15	5

7. The market risk capital charge for the portfolio of foreign exchange options is the summation of:
   (i) General Risk on delta-weighted position incorporated in **Part D.2.3 Foreign Exchange Risk**; and
   (ii) Gamma and Vega risks charge provided under **Part D.2.5 Treatment of Options**.

General Risk on delta-weighted position of currency options which will be incorporated in Part D.2.3 Foreign Exchange Risk

8. To compute the general risk on delta-weighted position of the foreign exchange option portfolio, the following steps should be taken:

a) The first step under the delta-plus method is to calculate the delta-weighted option position. This is accomplished by multiplying the value of each option's delta by the market value of the underlying currency position (see **Table C**, column 3). This leads to the following net delta-weighted position in each currency:

Table C

Option	Currency Pair	Delta × Market Value of Underlying
1	USD/RM	-251,500
2	USD/RM	-975,305
3	USD/RM	114,005
4	USD/RM	352,350
5	GBP/JPY	-209,823
6	GBP/JPY	157,737
7	GBP/JPY	337,691

b) Assuming that the banking institution holds no other foreign currency positions, inclusion of these positions into the framework set out in Part A.3 Foreign Exchange Risk yields a net open delta-weighted position of 1,046,055 (the larger of either the sum of the net short positions or the sum of the net long positions across currency pairs) and a capital charge of **RM83,684** (1,046,055 × 0.08).

GBP	USD	JPY
+ 285,605	- 760,450	- 285,605
+ 285,605.45	- 1,046,055	

Hence, the capital charge for general risk on delta-weighted position of the foreign exchange option which should be reflected in **Part D.2.3 Foreign Exchange Risk** will be **RM83,684**.

Gamma and Vega Risks carved out to be provided under Part D.2.5 Treatment of Options

9. Under the delta-plus method, the capital charges for Gamma and Vega risk will be calculated as follows:

a) The Gamma impact (see **Table D**, column 3) for each option is calculated as:

½ × Gamma (RM) × (market value of 1 unit of underlying (RM) × 0.08)^2

For each underlying, in this case currency pair, a net Gamma impact is obtained:

USD/RM	-164.18
GBP/JPY	+415.92

Only the negative Gamma impacts are included in the capital calculation, hence the Gamma charge here is **RM164.**

Table D

Option	Currency Pair	Gamma Impact (RM)	Net Gamma Impact (RM)
1	USD/RM	17.70	
2	USD/RM	-265.45	-164.18
3	USD/RM	-96.35	
4	USD/RM	179.91	
5	GBP/JPY	250.32	
6	GBP/JPY	-30.81	+415.92
7	GBP/JPY	196.41	

b) The Vega capital charge is based on the assumed implied volatilities for each option which are shown in **Table E** column 3. The 25 per cent volatility shifts are shown in **Table E** column 5. Multiplying these shifts with each option's Vega and the market value of underlying in RM, yields the assumed price changes (shown in Table E column 6). These are then summed up for each currency pair. The net Vega impact for each currency pair is:

USD/RM	-27,757.35
GBP/JPY	+33,895.59

Since no netting of Vegas is permitted across currency pairs, the capital charge is calculated as the sum of the absolute values obtained for each currency pair: 27,757 + 33,896 = **RM61,653**

Table E

Option	Currency Pair	Assumed Volatility (%)	Vega	Volatility Shift (Percentage Points)	Change in Value (RM)	Net Vega Impact (RM)
1	USD/RM	5	1.84	1.25	7,203.60	-27,757.35
2	USD/RM	20	-3.87	5.00	-90,906.30	
3	USD/RM	20	-0.31	5.00	-2,427.30	
4	USD/RM	10	4.97	2.50	58,372.65	
5	GBP/JPY	10	5.21	2.50	32,152.21	+33,895.59
6	GBP/JPY	7	-4.16	1.75	-12,836.20	
7	GBP/JPY	5	3.15	1.25	14,579.58	

The total capital charge for Gamma and Vega risk arising from the options portfolio which should be disclosed in **Part D.2.5 Treatment of Options** under the Delta-plus method is **RM61,817** (that is 164 + 61,653).

10. The total market risk capital charge for the portfolio of foreign currency options is **RM145,501** (that is 83,684 + 61,817).

Example 5: The Scenario Approach for Options

1. Consider a banking institution holding a portfolio of two KLCI equities and two options on the same equities as set out below:

Equity

		No of Shares	Current Price (RM)
Long	ABC	100	19.09
Short	XYZ	-50	1.79

Option

	No. of Shares	Option Type	Delta	Time to Expiry (yrs)	Strike Price (RM)	Current Volatility (%)
Long ABC	50	Call	0.43	0.45	20.00	15.0
Short XYZ	20	Put	-0.76	0.36	2.25	42.0

(Assumed risk free rate: 5%)

2. The market risk capital charge for the portfolio is the summation of the:
   i) Specific Risk of the equities and delta-weighted positions of underlying equities. This specific risk is incorporated in **Part D.2.2 Equity Position Risk** of the framework; and
   ii) General Risk of the portfolio, which is carved out and subjected to Scenario Approach in **Part D.2.5 Treatment of Options** of the framework.

Specific Risk of the equities and delta-weighted positions of the underlying equities to be incorporated in Part D.2.2 Equity Position Risk

3. To compute the specific risk for the equities and equity options, the following steps should be taken:
   a) Calculate the delta-weighted positions of the underlying equities – the delta weighted option is calculated by multiplying the value of each option's delta by the market value of the underlying equity (see **Table F**, column 2). This leads to the following net delta-weighted position in each equity:

Table F

Options Position	Delta × Market Value of Underlying (RM)	Number of Shares	Total Position (RM)
Option on ABC	8.115	50	405.75
Option on XYZ	-1.363	20	-27.25

Equity Position	Market Value (RM)	Number of Shares	Total Position (RM)
ABC	19.09	100	1,909.00
XYZ	1.79	- 50	-89.50

Assuming that the banking institution does not hold other equity positions, the delta weighted positions of the options will be added to the respective value of equities (ABC and XYZ) held. The net position for each equity will be incorporated in **Part D.2.2 Equity Position Risk** of this framework and the values are as follows:

ABC = + 2,314.75 [405.75 + 1,909.00]

XYZ = - 116.75 [-27.25 - 89.50]

b) Calculate the specific risk charge by multiplying the specific risk weight of the equities as listed in **Table 7** of **Part D.2.2 Equity Position Risk**. In this example, the specific risk weight is 8% for KLCI equities. Hence, the total capital charge for specific risk to be reflected in **Part D.2.2 Equity Position Risk** will be **RM194.52** [(2,314.75 x 0.08) + (116.75 x 0.08)].

General Risk is carved out and be subjected to the Scenario Approach in Part D.2.5 Treatment of Options

4. To compute the general risk under the **Scenario Approach**, the following procedures are taken:

a) Apply the price movements over the range ±8% to the equity positions. The change in portfolio values is shown below:

Change in Value of Equity Positions

	Assumed Price Change (%)						
	-8.00	**-5.33**	**-2.67**	**0.00**	**2.67**	**5.33**	**8.00**
ABC	-152.72	-101.81	-50.91	0.00	50.97	101.74	152.72
XYZ	7.16	4.77	2.39	0.00	-2.39	-4.77	-7.16

b) Apply the matrix of price and volatility movements to the ABC call options and the changes in the value of the options are shown below:

ABC Options - Change in Value

Assumed Volatility Change (%)	Assumed Price Change (%)						
	-8.00	**-5.33**	**-2.67**	**0.00**	**2.67**	**5.33**	**8.00**
+25	-15.57	-9.21	-0.92	9.46	21.98	36.58	53.15
0	-21.46	-16.58	-9.53	0.00	12.17	26.95	44.15
-25	-25.82	-22.84	-17.58	-9.32	2.36	17.51	35.78

c) Holding of XYZ put options will be subjected to the same treatment as per (b) above and the changes in the value of the options are shown below.

XYZ Options - Change in Value

Assumed Volatility Change (%)	Assumed Price Change (%)						
	-8.00	**-5.33**	**-2.67**	**0.00**	**2.67**	**5.33**	**8.00**
+25	+2.82	+2.20	+1.46	+0.75	+0.07	-0.58	-1.08
0	+2.26	+1.59	+0.78	0.00	-0.74	-1.45	-1.99
-25	+1.87	+1.13	+0.24	-0.63	-1.45	-2.24	-2.84

d) Summing the changes in the value for ABC and XYZ equities and the equity options to arrive at the contingent loss matrix for the total portfolio as shown below:

Total Portfolio - Change in Value

Assumed Volatility Change (%)	Assumed Price Change (%)						
	-8.00	**-5.33**	**-2.67**	**0.00**	**2.67**	**5.33**	**8.00**
+25	-158.31	-104.05	-47.98	10.21	70.56	133.04	197.63
0	-164.76	-112.03	-57.27	0.00	59.95	122.54	187.72
-25	-169.52	-118.75	-65.86	-9.95	49.43	112.30	178.50

The general risk capital charge for the portfolio will be the largest loss arising from changes in the price of the equities and volatility of the options as shown in the matrix above - in this case is **169.52**. This capital charge will be reflected in **Part D.2.5 Treatment of Option** under the Scenario approach.

5. The total market risk capital charge for the portfolio is **364.04** (that is 169.52 +194.52).

D.3 INTERNAL MODELS APPROACH

Introduction

5.132 This framework sets out the minimum standards and criteria that the Bank will use in assessing a banking institution's eligibility for adopting the internal models approach in measuring market risk for the purpose of capital adequacy. The internal model approach specified in this guideline is based on the use of value-at-risk (VaR) technique.

5.133 The use of an internal model will be conditional upon explicit written approval from the Bank. The Bank will recognise a banking institution's internal model for capital adequacy if all the standards set forth in this Part are met. Any approval will be conditional on continued compliance with the requirements under this framework, as modified from time to time.

5.134 Further to the Bank's initial recognition, banking institutions should inform the Bank of any subsequent material change to the models, including material change in methodology or scope to cover new products and instruments. Banking institutions are required to demonstrate to the Bank that the models remain relevant for the purpose of ascertaining market risk capital charge.

5.135 For banking institutions with Islamic banking operations, the recognition of the internal models for the purpose of ascertaining market risk capital requirements will be applied on a bank-wide basis. Nevertheless, the capital requirements and back testing results for conventional and Islamic banking operations activities should be separately reported.

D.3.1 COMBINATION OF INTERNAL MODELS AND THE STANDARDISED MARKET RISK MEASUREMENT APPROACH

5.136 Banking institutions have the option to use a combination of the standardised market risk measurement approach and the internal models approach to measure market risks across broad risk categories (that is interest/profit rates, exchange rates, equity prices and commodity prices, with related options volatilities being included in each risk factor category). In doing so, banking institution should ensure no element of market risk shall escape measurement.

5.137 Depending on the significance and complexity of the banking institution's trading activities, the Bank may require banking institution to adopt an internal model approach that is sufficiently comprehensive to capture all broad risk categories.

5.138 Notwithstanding paragraph 5.136, as a general rule, a combination of the standardised market risk measurement approach and internal models approach will not be permitted within the same risk category or across banking institutions' different entities for the same risk category[230]. However, banking institutions may incur risks in positions which are not captured by the adopted models, for example, in minor currencies, negligible business areas or exposures in risk types that are not easily modelled such as underwriting risk. Such risks may be separately measured according to the standardised market risk measurement approach, subject to the Bank's approval. **Table 11** and **Table 12** illustrate examples of situations where the combination of the standardised market risk measurement approach and internal model approach are permitted.

[230] With the exception of specific risk when capital requirement will be assessed based on the standardised market risk measurement approach, unless it meets the modelling requirement in **Part D.3**

Table 11: Combination of Internal Models and the Standardised Market Risk Approach

Combinations of Approaches*	Broad Risk Categories (that is interest/profit rates, exchange rates, equity prices and commodities prices, with related options volatilities included in their respective risk factor category)	
	Within a Risk Category	**Across** Risk Categories
Combination of different internal models	Permitted	Permitted
Combination of SMRA and IMA	Not Permitted	Permitted

Table 12: Examples on the Combination of Approaches

Combinations of Approaches	Broad Risk Categories				Are the combinations of approaches permitted?
	Interest/ Profit Rate	Equity	Foreign Exchange	Commodity	
SMRA and IMA across broad risk categories	IMA	IMA	SMRA	SMRA	Yes
SMRA and IMA within a broad risk category	IMA	IMA	Spot, forwards and swaps: IMA Options: SMRA	SMRA	The use of a combination of IMA and SMRA approaches is not permitted within foreign exchange risk category. FX risk should be measured in its entirety using IMA or SMRA
Different IMA approaches within and across broad risk categories	IMA (Historical simulation)	IMA (Monte Carlo)	Spot, forwards and swap: IMA (Variance-covariance) Options: IMA (Monte Carlo)	IMA (Historical simulation)	Yes
SMRA – Standardised Market Risk Approach, IMA – Internal Models Approach					

5.139 In addition, banking institutions may use a combination of different internal models within a risk category, or across broad risk categories.

5.140 Banking institutions that have had their internal models approved by the Bank, are not allowed to revert to measuring risks using the standardised market risk measurement approach unless the Bank withdraws approval for the internal model or with specific permission from the Bank.

5.141 Where capital charges are assessed under the standardised market risk measurement approach and the models approach within a same broad risk category, the applicable capital charges should be aggregated according to the simple aggregation method. Similarly, capital charges assessed using different models within and across each broad risk category should also be aggregated using the simple aggregation method.

5.142 In principle, banking institutions which adopt the modelling alternative for any single risk category will be expected over time to move towards a comprehensive model (that is one that captures all market risk categories).

D.3.2 QUALITATIVE STANDARDS

5.143 Banking institutions must ensure that models adopted are supported by market risk management systems that are conceptually sound. Banking institution must satisfy certain criteria before adoption of model-based approach for the purpose of regulatory capital adequacy calculation. The adherence to the qualitative criteria will determine the multiplication factor in paragraph 5.144(j).

a) Banking institution should have an independent risk control unit that is responsible for the design and implementation of the banking institution's risk management system. The unit is responsible for producing and analysing daily reports on the output of banking institution's risk measurement model, including evaluation of limit utilisation. This unit must be independent from business trading and

other risk taking units and should report directly to senior management of the banking institution.

b) The unit should conduct a regular (at least on a quarterly basis) back testing program, that is an ex-post comparison of the risk measure generated by the model against actual daily changes in portfolio value over longer periods of time, as well as hypothetical changes based on static positions. Detailed discussion of back testing is provided in **Part D.3.9 Framework for the Use of Back Testing**.

c) The unit should also conduct the initial and ongoing validation of the internal model[231]

d) While the board retains oversight role, senior management are expected to be actively involved in the risk control process and regard risk control as an essential aspect of the business to which significant resources need to be devoted. In this regard, the daily reports prepared by the independent risk control unit must be reviewed by a level of management with sufficient seniority and authority to enforce both reductions of positions taken by individual traders and reductions in the banking institution's overall risk exposure.

e) The internal risk measurement model must be closely integrated into the day-to-day risk management process of the banking institution. Accordingly, the output of the model should be an integral part of the process of planning, monitoring and controlling of the banking institution's market risk profile.

f) The risk measurement system should be used in conjunction with internal trading and exposure limits. Trading limits should be related to the banking institution's VaR measurement model in a manner that is consistent over time and that is well understood by both traders and senior management.

g) A routine and rigorous program of stress testing should be in place as a supplement to the risk analysis based on the day-to-day output of the banking institution's risk measurement model. The results of stress testing exercises should be reflected in the policies and limits set by

[231] Further guidance regarding the standards found in **Part D.3.7 Model Validation Standards**.

management and the board. The results of stress testing should be routinely communicated to senior management and, periodically, to the banking institution's board.

h) Banking institutions should establish a process to ensure continuous compliance with internal policies, controls and procedures relating to the operation of the risk measurement system. Banking institution's risk measurement system must be well documented, for example, through a risk management manual that describes the basic principles of the risk management system and provides an explanation of the empirical techniques used to measure market risk.

i) An independent review of the risk measurement system should be carried out on a regular basis as part of the banking institution's own internal process. This review should include both the activities of the business trading units and the independent risk control unit. A review of the overall risk management process should take place at regular intervals (ideally not less than once a year) and should specifically address, at a minimum:

   i) The adequacy of the documentation of the risk management system and process;
   ii) The organisation of the risk control unit;
   iii) The approval process for risk pricing models and valuation systems used by front and back-office personnel;
   iv) The validation of any significant change in the risk measurement process;
   v) The scope of market risks captured by the risk measurement model;
   vi) The integrity of the management information system;
   vii) The accuracy and completeness of position data;
   viii) The verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources;
   ix) The accuracy and appropriateness of volatility and correlation assumptions;

x) The accuracy of valuation and risk transformation calculations;

xi) The verification of the model's accuracy through frequent back testing as described in paragraph 5.143(b) and in **Part D.3.9 Framework for the Use of Back Testing.**

D.3.3 QUANTITATIVE STANDARDS

5.144 Banking institutions are given the flexibility to devise an internal model, but the following minimum standards will apply for the purpose of calculating their capital charge:

a) VaR should be computed on a daily basis at the close of the trading day.

b) In calculating the VaR, a 99th percentile, one-tailed confidence interval should be used.

c) In calculating VaR, an instantaneous price shock equivalent to a ten-day movement in prices should be used (since the minimum holding period is ten trading days). Banking institutions with illiquid trading exposure should make appropriate adjustments to the holding period. For positions that display linear price characteristics (but not options), banking institutions may use VaR numbers calculated according to shorter holding periods, scaled up to the requisite holding period by the square root of time (for the treatment of options, also see (h) below).

d) The historical observation period (sample period) for calculating VaR will be constrained to a minimum length of one year. For banking institutions 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 individual observations should be no less than 6 months.

e) Banking institutions should update data sets no less frequently than once every three months and should also reassess the data whenever market prices are subject to material changes. The Bank may also require banking institution to calculate its VaR using a shorter

observation period if, in the Bank's judgement, is justifiable because of a significant upsurge in price volatility.

f) No particular type of model is prescribed. Banking institutions are free to use models based on variance-covariance matrices, historical simulations, or Monte Carlo simulations, so long as each model used captures all the material risks run by the institution as set out in **Part D.3.4 Specification of Market Risk Factors**.

g) Banking institutions are given the discretion to recognise empirical correlations within broad risk categories (for example interest/profit rates, exchange rates, equity prices and commodity prices, including related options volatilities in each risk factor category). The Bank may also recognise empirical correlations across broad risk factor categories, provided the Bank is satisfied that the institution's system for measuring correlations is sound and implemented with integrity.

h) Banking institutions' models must accurately capture the unique risks associated with options within each of the broad risk categories. The following criteria apply to the measurement of options risks:

   i) Banking institutions' models must capture the non-linear price characteristics of options positions;

   ii) Banking institutions are expected to ultimately move towards the application of a full 10-day price shock to options positions or positions that display option-like characteristics. In the interim, the Bank may require banking institutions to adjust their capital measure for options risk through other methods for example, periodic simulation or stress testing;

   iii) Each banking institution's risk measurement system must have a set of risk factors that captures the volatilities of the rates and prices underlying option positions, that is, vega risk. Banking institutions with relatively large and/or complex options portfolios should have detailed specifications of the relevant volatilities. This means that institutions should measure the volatilities of the options positions broken down by different maturities.

i) Each banking institution must meet, on a daily basis, a capital requirement expressed as the higher of (a) the previous day's VaR number measured according to the parameters specified in this part or (b) an average of the daily VaR measures on each of the preceding 60 business days multiplied by the multiplication factor.

j) The minimum multiplication factor is set at 3. The Bank reserve the right to increase the multiplier by an add-on based on any shortcomings in the qualitative criteria. In addition, the Bank will require banking institutions to add to this factor a 'plus' directly related to the ex-post performance of the model. The 'plus' will range from 0 to 1 based on the outcome of 'back testing'. The **Part D.3.9 Framework for the Use of Back Testing** presents in detail the approach to be applied for back testing. Banking institutions should perform backtesting on both hypothetical trading outcomes (that is using changes in portfolio value that would occur if end-of-day positions were to remain unchanged) and actual trading outcomes (that is excluding fees, commissions, net interest income and other income not attributable to outright position taking).

k) Banking institutions using models will be subjected to a separate capital charge to cover the specific risk of interest/profit rate related instruments and equity securities, as defined under the standardised approach for market risk. The options for calculating the specific risk capital charge are set out in **Part D.3.5 Modelling of Specific Risk**.

D.3.4 SPECIFICATION OF MARKET RISK FACTORS

5.145 An important part of a banking institution's internal market risk measurement system is the specification of an appropriate set of market risk factors, that is the market rates and prices that affect the value of the banking institution's market-related positions. The risk factors contained in a market risk measurement system should be sufficient to capture the risks inherent in the banking institution's portfolio of on- and off-balance sheet trading positions. Although banking institutions are given discretion

in specifying the risk factors for internal models, all requirements under this part (paragraphs 5.156 to 5.154) should be met.

Interest/Profit Rates[232]

5.146 There must be a set of risk factors corresponding to interest/profit rates in each currency in which the banking institution has interest/profit rate sensitive on- or off-balance sheet trading book positions.

5.147 The risk measurement system should model the yield curve using one of a number of generally accepted approaches, for example, by estimating zero-coupon yields. The yield curve should be divided into various maturity segments in order to capture variation in the volatility of rates along the yield curve; there will typically be one risk factor corresponding to each maturity segment. For material exposures to interest/profit rate movements in the major currencies and markets, banking institution must model the yield curve using a minimum of six risk factors. Ultimately, the number of risk factors used should be driven by the nature of the banking institution trading strategies. For instance, banking institution with a portfolio of various types of securities across many points of the yield curve, and that engages in complex arbitrage strategies, would require a greater number of risk factors to capture interest/profit rate risk accurately.

5.148 The risk measurement system should incorporate separate risk factors to capture basis risk (for example, between bonds/*sukūk* and swaps). A variety of approaches may be used to capture the basis risk arising from less than perfectly correlated movements between government and other fixed-income interest/profit rates, such as specifying a completely separate yield curve for non-government fixed income instruments (for example, swaps or municipal securities) or estimating the spread over government rates at various points along the yield curve. For countries where

[232] Measurement of risks for Islamic principle-based instruments such as *sukūk* that are exposed to profit rate risk would be subjected to the same requirements described in paragraphs 5.146 to 5.148.

interest/profit rates may be less responsive to market forces, banking institutions should appropriately reflect in their internal models the effects on interest/profit rate conditions as a result of actual or anticipated interest/profit rate management regime shifts, where relevant.

Equity Prices

5.149 There should be risk factors corresponding to each of the equity markets to which banking institution holds significant exposure.

a) At a minimum, there should be a risk factor designed to capture market-wide movements in equity prices (for example, a market index). Positions in individual securities or in sector indices could be expressed in 'beta-equivalents[233] relative to the market-wide index.

b) Another detailed approach is to incorporate risk factors corresponding to various sectors of the overall equity market (for example, industry sectors or cyclical and non-cyclical sectors). As above, positions in individual shares within each sector could be expressed in beta-equivalents relative to the sector index.

c) The most extensive approach would be to incorporate risk factors corresponding to the volatility of individual equity issue.

5.150 The sophistication and nature of the modelling technique for a given market should correspond to the banking institution's exposure to the overall market and as its concentration in individual equity issues in that market.

Exchange Rates (including Gold and Silver)

5.151 The risk measurement system should incorporate risk factors corresponding to the individual foreign currencies in which banking institution's positions are denominated. Since the VaR figure calculated by the risk measurement system will be expressed in Malaysian ringgit, any

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

net position denominated in a foreign currency will introduce a foreign exchange risk. Thus, there must be risk factors corresponding to the exchange rate between the domestic currency and each foreign currency in which banking institution has significant exposure. For currencies where the exchange rate regime may be fixed, pegged, or otherwise constrained, banking institutions should appropriately reflect actual or expected effects of exchange rate regime shifts in the internal models through adjustments of a currency's volatilities and correlations, where relevant.

Commodity Prices

5.152 There should be risk factors corresponding to each of the commodity markets in which banking institution holds significant positions.

5.153 For banking institutions with relatively limited positions in commodity-based instruments, a straightforward specification of risk factors would be acceptable. Such specification would likely entail one risk factor for each commodity price to which the banking institution is exposed. In cases where the aggregate positions are quite small, it might be acceptable to use a single risk factor for a relatively broad sub-category of commodities (for instance, a single risk factor for all types of oil).

5.154 The model must also take into account variation in the 'convenience yield'[234] between derivatives positions, such as forwards and swaps, and cash positions in the commodity.

D.3.5 MODELLING OF SPECIFIC RISK

5.155 Banking institutions using internal models are permitted to base specific risk capital charge on modelled estimates if the VaR measure incorporates specific risk and meet all qualitative and quantitative requirements for

[234] The convenience yield reflects the benefits from direct ownership of the physical commodity (for example, the ability to profit from temporary market shortages) and is affected both by market conditions and by factors such as physical storage costs.

general market risk models as detailed in **Part D.3.2 Qualitative Standards** and **Part D.3.3 Quantitative Standards** and the additional criteria set out in this part.

5.156 Banking institutions which are unable to meet these additional criteria are required to base specific risk capital charge on the full amount of such charge calculated under the standardised market risk approach.

5.157 The criteria for supervisory recognition of banking institutions' modelling of specific risk requires that banking institution's model must capture all material components of price risk and be responsive to changes in market conditions and composition of portfolios. In particular, the model should:

a) Explain the historical price variation within the portfolio[235];
b) Capture concentrations (magnitude and changes in composition)[236];
c) Robust to an adverse environment[237];
d) Capture name-related basis risk[238];
e) Capture event risk[239];

---

235 The key ex-ante measures of model quality are 'goodness-of-fit' measures which address the question of how much of the historical variation in price value is explained by the risk factors included within the model. One measure of this type which can often be used is an R-squared measure from regression methodology. If this measure is to be used, the risk factors included in the banking institution's model would be expected to be able to explain a high percentage, such as 90%, of the historical price variation or the model should explicitly include estimates of the residual variability not captured in the factors included in this regression. For some types of models, it may not be feasible to calculate a goodness-of-fit measure. In such instance, a banking institution is expected to work with the Bank to define an acceptable alternative measure which would meet this regulatory objective.

236 The banking institution would be expected to demonstrate that the model is sensitive to changes in portfolio construction and that higher capital charges are attracted for portfolios that have increasing concentrations in particular names or sectors.

237 The banking institution should be able to demonstrate that the model will signal rising risk in an adverse environment. This could be achieved by incorporating in the historical estimation period of the model at least one full credit cycle and ensuring that the model would not have been inaccurate in the downward portion of the cycle. Another approach for demonstrating this is through simulation of historical or plausible worst-case environments.

238 Banking institutions should be able to demonstrate that the model is sensitive to material idiosyncratic differences between similar but not identical positions, for example debt positions with different levels of subordination, maturity mismatches, or credit derivatives with different default events.

239 For debt positions, this should include migration risk. For equity positions, events that are reflected in large changes or jumps in prices must be captured, for example merger break-ups/takeovers. In particular, firms must consider issues related to survivorship bias.

f) Validated through back-testing aimed at assessing whether specific risk is being captured adequately.

5.158 Where a banking institution is subjected to event risk that is not reflected in its VaR measure because it is beyond the ten-day holding period and 99th percentile confidence interval (that is low probability and high severity events), the impact of such events must be factored into its internal capital assessment, for example, through stress testing.

5.159 A banking institution's model should conservatively assess the risk arising from less liquid positions and positions with limited price transparency under realistic market scenarios. In addition, the model should meet the minimum data standards set out under paragraph 5.144(d). Proxies may be used only where available data are insufficient or not reflective of the true volatility of a particular position or portfolio, and should be conservatively used.

5.160 As techniques and best practices evolve, banking institutions should keep abreast of these advances.

5.161 Banking institutions should also have an approach in place to capture in their regulatory capital the default risk of the trading book positions that is incremental to the risk captured by the VaR-based calculation as specified in paragraph 5.157. To avoid double counting, a banking institution may, when calculating incremental charge for default risk, take into account the extent to which the default risk has already been incorporated into the VaR calculation, especially for risk positions that could be closed within ten days in the event of adverse market conditions or other indications of deterioration in the credit environment.

5.162 No specific approach for capturing incremental default risk is prescribed. The approach may be part of a banking institution's internal model or a surcharge from a separate calculation. Where a banking institution

captures its incremental risk through a surcharge, the surcharge will not be subjected to a multiplication factor or regulatory back-testing, although banking institution should be able to demonstrate that the surcharge meets its objectives (that is providing sufficient capital to cover default risk).

5.163 Whichever approach is used, a banking institution should demonstrate that it meets the standards of soundness comparable to those of internal-ratings based (IRB) approach for credit risk as set forth under the credit risk component of this framework, based on the assumption of constant level of risk, and adjusted where appropriate to reflect the impact of liquidity, concentrations, hedging and optionality. A banking institution that does not capture the incremental default risk through an internally developed approach must use the fallback of calculating the surcharge through an approach consistent with that for credit risk as set forth in the credit risk component of this framework[240].

5.164 Whichever approach is used, cash or synthetic exposures and securitisation exposures that are unrated liquidity lines or letters of credit, are subject to a capital charge that is no less than that set forth under the Securitisation Framework.

5.165 An exception to this treatment could be afforded to a banking institution that is a dealer in the above exposures where it 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 the constituents risk components. For the purposes of this part, a two-way market is deemed to exist where there are independent bona fide offers to buy and sell with prices being reasonably related to the last sale price or where current bona fide competitive bid and offer quotations can be determined within one day and settled at such price within a relatively

[240] Approaches premised upon internal-rating based models will not be allowed for specific risk measurement unless explicitly approved by the Bank.

short time for the trade to be confirmed. In addition, for a banking institution to apply this exception, it must 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 in accordance with the standards set forth above.

5.166 Banking institutions which apply modelled estimates of specific risk are required to conduct back testing aimed at assessing whether specific risk is being accurately captured. The methodology that a banking institution should use to validate its specific risk estimates is to perform separate back tests on sub-portfolios, using daily data on sub-portfolios subject to specific risk. The key sub-portfolios for this purpose are traded-debt and equity positions. However, if banking institution decomposes its trading portfolio into finer categories (for example emerging markets, traded corporate debt, etc.), it is appropriate to keep these distinctions for sub-portfolio back testing purposes. Banking institutions are required to commit to a sub-portfolio structure and continuously apply it unless it can be demonstrated to the Bank that it is reasonable to change the structure.

5.167 Banking institutions are required to have in place a process to analyse exceptions identified through the back testing of specific risk. This process is intended to serve as the fundamental way in which banking institutions correct internal models of specific risk in the event it becomes inaccurate. There will be a presumption that models that incorporate specific risk are 'unacceptable' if the results at the sub-portfolio level produce a number of exceptions commensurate with the Red Zone as defined in **Part D.3.9 Framework for the Use of Back Testing**. Banking institutions with 'unacceptable' specific risk models are expected to take immediate remedial action to correct the model and ensure sufficient capital buffer to absorb the risk identified by the back test.

D.3.6 STRESS TESTING

5.168 Banking institutions that use the internal models approach for meeting market risk capital requirements must have in place a rigorous and comprehensive stress testing program. Stress testing to identify events or influences that could greatly impact banking institutions is a key component of an institution's assessment of its capital position.

5.169 Banking institutions' stress scenarios need to cover a range of factors that can create extraordinary losses or gains in the trading books, or make the control of risk in those books very difficult. These factors include low-probability events in all major types of risks, including the various components of market, credit, and operational risks. Stress scenarios need to shed light on the impact of such events on positions that display both linear and non-linear price characteristics (that is options and instruments that have options-like characteristics).

5.170 Banking institutions' stress tests should be both of a quantitative and qualitative in nature, incorporating both market risk and liquidity aspects of market disturbances. Quantitative criteria should identify plausible stress scenarios to which institutions could be exposed. Qualitative criteria should emphasise two aspects of stress testing; to evaluate the capacity of the institution's capital to absorb potential large losses and to identify steps the institution can take to reduce risk and conserve capital. This assessment is integral to setting and evaluating the institution's management strategy and the results of stress testing should be routinely communicated to senior management and, periodically, to the banking institution's board.

5.171 Banking institutions should combine the use of supervisory stress scenarios with internal stress tests developed by institutions to reflect specific risk characteristics. In particular, the Bank will require banking

institutions to provide information on stress testing in three broad areas as part of the monthly statistical submission to the Bank:

a) Supervisory scenarios requiring no simulations by the institution

Banking institutions should provide information on five largest daily losses experienced during the reporting period. The loss information could be compared to the level of capital that results from an institution's internal measurement system. This would provide a picture of how many days of peak day losses could be covered by the reported capital, based on the banking institution’s value-at-risk estimate.

b) Scenarios requiring a simulation by banking institution

Portfolios of banking institutions are subjected to a series of simulated stress scenarios.

i) These scenarios should include testing the current portfolio against past periods of significant disturbance, for example the 1987 equity crash, the ERM crisis of 1992 and 1993 or the fall in bond markets in the first quarter of 1994, or the Asian financial crisis of 1997 and 1998, incorporating both large price movements and the sharp reduction in liquidity associated with these events.

ii) A second type of scenario would evaluate the sensitivity of the banking institution's market risk exposure to changes in the assumptions about volatilities and correlations. Applying this test would require an evaluation of the historical range of variation for volatilities and correlations and evaluation of the institution's current positions against the extreme values of the historical range. Due consideration should be given to sharp variation that at times occurred in a matter of days in periods of market disturbance. Several of the historical examples highlighted in (b)(i) above involved correlations within risk factors approaching the extreme values of 1 or -1 for several days at the height of the disturbance.

iii) The Bank will normally not prescribe the simulated scenarios for use in stress testing, although it may do so in the event of a particular market circumstances.

c) Scenarios developed by the institution itself to capture the specific characteristics of its portfolio

In addition to the scenarios described in paragraph (a) and (b) above, banking institution should also develop its own stress tests which it identifies as the most adverse based on the characteristics of its portfolio (for example, problems in a key region of the world combined with a sharp move in oil prices). Banking institutions should provide the Bank with a description of the methodology used to identify and carry out the scenarios as well as a description of the results derived from these scenarios.

5.172 The stress test results should be reviewed periodically by senior management and reflected in the policies and limits set by the board. Moreover, if the testing reveals a particular vulnerability to a given set of circumstances, the Bank would expect the institution concerned to take prompt steps to remedy those risks appropriately (for example, by hedging against the adverse outcome or reducing the size of exposures).

D.3.7 MODEL VALIDATION STANDARDS

5.173 Banking institutions should have processes in place to ensure that internal models have been suitably validated by qualified and independent parties with relevant and sufficient expertise and experience, separate from the development process to ensure that models are conceptually sound and capture all material risks.

5.174 Model validation should be independent of model development to the extent feasible. Where complete independence is not achievable, risk policies should provide for effective reporting of validation party to an independent management and board risk committees. This internal model

validation process and its results should also be reviewed by internal and external auditors.

5.175 The validation should be conducted when the model is initially developed and when significant changes are made to the model. The validation should also be conducted on a periodic basis especially when there are significant structural changes in the market or changes to the composition of the portfolio which might lead to the model no longer being relevant.

5.176 Where specific risk is also modelled, it is important for banking institutions to conduct more extensive model validation and demonstrate that the models satisfy the criteria for specific risk modelling as set out in **Part D.3.5 Modelling of Specific Risk**.

5.177 Model validation should not be limited to back-testing, but should, at a minimum, also include the following:

a) Tests to demonstrate that any assumptions made within the internal model are appropriate and do not underestimate risk. This may include assumption of normal distribution, the use of square root of time to scale from a one-day holding period to a ten-day holding period or where extrapolation or interpolation techniques are used, or pricing models.

b) Further to the regulatory back-testing programmes, testing for model validation should be carried out using additional tests, which may include, for instance:

   i) Testing carried out for longer periods than required for the regular back-testing programme (for example three years), except where the VaR model or market conditions have changed to the extent that historical data are no longer relevant;

   ii) Testing carried out using confidence intervals other than the 99% interval required under the quantitative standards;

   iii) Testing of sub-portfolios;

iv) Comparing predicted trading outcomes against actual and hypothetical profit and loss.

c) The use of hypothetical portfolios to ensure that the model is able to account for particular structural features that may arise, for example:

i) Where the data history for a particular instrument does not meet the quantitative standards in paragraphs 5.144 Part D.3.3 Quantitative Standards and where the banking institution has to map these positions to proxies, banking institution should ensure that proxies used produce conservative results under relevant market scenarios;

ii) Banking institution should ensure that material basis risks are adequately captured. This may include mismatches between long and short positions by maturity or by issuer;

iii) Banking institution should also ensure that the model adopted captures concentration risk that may arise in a portfolio that is not diversified.

D.3.8 MODEL REVIEW

5.178 In reviewing banking institution's internal model, the Bank will also require assurance that:

a) The internal validation processes described in **Part D.3.7 Model Validation Standards** are operating in a satisfactory manner.

b) The formulae used in the calculation process and for pricing of options and other complex instruments are validated by a qualified unit, which in all cases should be independent from the trading area.

c) The structure of internal models is adequate with respect to the institution's activities and geographical coverage.

d) The results of the institutions' back-testing of its internal measurement system (that is comparing VaR estimates with actual profits and losses) ensure that the model provides a reliable measure of potential losses over time. The results and the underlying inputs to the VaR

calculations should be available to the Bank and external auditors on request.

e) Data flows and processes associated with the risk measurement system are transparent and accessible. In particular, it is necessary that auditors or the Bank have easy access to data and information, whenever it is necessary and and reasonable under appropriate procedures, to the models' specifications and parameters.

D.3.9 FRAMEWORK FOR THE USE OF BACK TESTING

5.179 This part presents the framework for incorporating back testing into the internal model approach to market risk capital requirements. It represents an elaboration of paragraph 5.143(b).

5.180 Back testing programs consist of a periodic comparison of banking institution's daily VaR measure with its daily profit or loss (trading outcome), to gauge the quality and accuracy of a banking institution's risk measurement systems. The VaR measures are intended to be larger than all but a certain fraction of the trading losses, where that fraction is determined by the confidence level of the VaR measurement. Comparing the risk measures with the trading outcomes simply means that banking institution counts the number of times that trading losses were larger than the risk measures. The fraction of greater than expected losses to total outcomes can then be compared with the intended level of coverage to gauge the performance of the banking institution's risk model. If the comparison yields close results, the back test raises no issues regarding the quality of the risk measurement model. In some cases, however, the comparison may uncover sufficient differences to indicate that problems almost certainly exist, either with the model or with the assumptions of the back test. In between these two cases is a grey area where the test results are, on their own, inconclusive.

Back Testing for Capital Adequacy Purposes

5.181 The back tests carried out for capital adequacy purposes compare whether the observed percentage of outcomes covered by the VaR measure is consistent with a 99 per cent level of confidence. That is, the tests attempt to determine if banking institution's 99th percentile risk-measures truly measure 99 per cent of the banking institution's trading outcomes.

5.182 In addition, the back testing framework requires the comparison of daily trading outcomes with a VaR measurement based on a one day holding period. This requirement is to reduce the contamination arising from changes in portfolio composition during the holding period which is reflected in actual profit and loss outcomes but not in VaR numbers which are calculated on a static end-of-day portfolio.

5.183 The same concerns about 'contamination' of the trading outcomes continue to be relevant, even for one day trading outcomes. The back test against an overall one day actual profit or loss on its own may not be adequate because it might reflect the effects of fee income and other income not attributable to outright position taking. A more sophisticated approach would involve a detailed attribution of income by source, including fees, spreads and market movements. In such a case the VaR results can be compared with the actual trading outcomes arising from market movements alone (that is back test is performed using a measure of actual profit and loss adjusted for fees, commissions and other income not attributable to outright position taking.

5.184 In addition, the back test most closely aligned to the VaR calculation would be the one based on the hypothetical changes in portfolio value that might occur if end-of-day positions were to remain unchanged. That is, instead of looking at a day's actual profit or loss, the hypothetical profit or loss obtained from applying the day's price movements to the previous day's end-of-day portfolio is calculated. This hypothetical profit or loss result can

then be compared against the VaR based on the same, static, end-of-day portfolio.

5.185 Banking institutions are expected to perform back tests using both hypothetical and actual trading outcomes. In combination, the two approaches are likely to provide a strong understanding of the relation between calculated risk measures and trading outcomes.

5.186 The back testing framework entails a formal testing and evaluation of exceptions on a quarterly basis using the most recent twelve months (or 250 trading days) of VaR and profit data. Banking institution must calculate the number of times that the trading outcomes are not covered by the risk measures (termed 'exceptions') using the most recent twelve months of data yields approximately 250 daily observations. The Bank will use the higher of the number of exceptions (out of 250 observations) based on the hypothetical and actual trading outcomes generated by a banking institution's model as the basis for a supervisory response. Based on the back testing results, the Bank may initiate a dialogue with banking institution to determine possible problem with banking institution's model. In more serious cases, the Bank may impose an increase in a banking institution's capital requirement or disallow use of internal model (see paragraphs 5.203 to 5.205 for more details).

5.187 The formal implementation of the back testing programme should begin on the date the internal models for measuring became effective. Notwithstanding this, banking institution applying to the Bank for recognition of an internal model should provide evidence that the model's back test results are based on the standards described in this part falls into the 'green zone' as described in paragraph 5.191 at the time of application.

Interpretation of Back Testing Results

5.188 With the statistical limitations of back testing in mind, supervisory interpretation of back testing results encompasses a range of possible responses, depending on the strength of the signals generated from the back test. These responses are classified into three zones, distinguished by colours into hierarchy of responses.

a) The green zone corresponds to back testing results that do not themselves suggest a problem with the quality or accuracy of banking institution's model.

b) The yellow zone encompasses results that do raise questions, but whose conclusion is not definitive. The back testing results could be consistent with either accurate or inaccurate models, and the Bank will require banking institution to present additional information about its model before any action is taken.

c) The red zone indicates a back testing result that almost certainly indicates a problem with banking institution's risk model and the Bank will require some remedial actions to be initiated.

5.189 **Table 13** below sets out the boundaries for these zones and the presumptive supervisory response for each back testing outcome, based on a sample of 250 observations. Where back testing indicates weaknesses in banking institution's model, a 'plus' factor will be added to the multiplication factor mentioned in paragraph 5.144(j).

Table 13: 'Plus' factor applicable to the internal models capital requirement resulting from backtesting results

Zones	No of Exceptions Out of 250 Daily Observations	'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+	1.00

5.190 Banking institutions must apply the 'plus' factor indicated in **Table 13** in determining its capital charge for market risk until it obtains the next quarter's back testing results, unless the Bank determines that a different adjustment or other action is appropriate.

The Green Zone

5.191 Since a model that truly provides 99 per cent coverage would be quite likely to produce as many as four exceptions in a sample of 250 outcomes, there is little reason for concern raised by back testing results that fall in this range. In such a case, the multiplication factor will not be increased (the plus factor will be zero), and no further action from banking institution is required.

The Yellow Zone

5.192 The range from five to nine exceptions constitutes the yellow zone. Outcomes in this range are plausible for both accurate and inaccurate models, although generally more likely for inaccurate than for accurate models. Moreover, the presumption that the model is inaccurate should grow as the number of exceptions increases in the range from five to nine.

5.193 Within the yellow zone, the number of exceptions should generally guide the size of potential supervisory increases in a banking institution's capital requirement. **Table 13** sets out the plus factors applicable to the internal models capital requirement, resulting from back testing results in the yellow zone.

5.194 It is important to emphasise that these increases are not meant to be purely automatic. Back testing results in the yellow zone should generally be presumed to imply an increase in the multiplication factor unless banking institution can demonstrate that such increase is not warranted.

5.195 There are many different types of additional information that might be relevant to assess banking institution's model. For example, it would be

particularly valuable to see the results of back tests covering disaggregated subsets of banking institution's overall trading activities. Many banking institutions that engage in regular back testing programs break up the overall trading portfolio into trading units organised around risk factors or product categories. Disaggregating risks into categories could allow the tracking of problems that surfaced at the aggregate level back to its source either at the level of specific trading unit or risk model.

5.196 Banking institutions should also document all exceptions generated from on-going back testing program, including an explanation for the exceptions. This documentation is important in determining an appropriate supervisory response to a back testing that resulted in yellow zone. Banking institutions may also implement back testing for confidence intervals other than the 99th percentile, or may perform other statistical tests not considered here.

5.197 In practice, there are several possible explanations for a back testing exception, some of which might lead to the basic integrity of the model, an under-specified or low-quality model, or poor intra-day trading results. Each of these problems is considered below. Classifying the exceptions generated by banking institution's model into the following categories can be a useful exercise.

a) Basic integrity of the model
    i) Banking institution's systems simply are not capturing the risk of the positions themselves (e.g. the positions of an overseas office are being reported incorrectly).
    ii) Model volatilities and correlations are calculated incorrectly.

b) Defects on model's accuracy
    - The risk measurement model is not assessing the risk of some instruments with sufficient precision (for example, too few maturity buckets or an omitted spread).

c) Abnormal markets movements unanticipated by the model

i) Random chance (a very low-probability event).

ii) Markets move more than the model predicted (that is, volatility was significantly higher than expected).

iii) Markets did not move together as expected (that is, correlations were significantly different than what was assumed by the model).

d) Intra-day trading

- Large (and money-losing) and unusual change in banking institution's positions or some other income event between the end of the first day (when the risk estimate was calculated) and the end of the second day (when trading results were tabulated).

5.198 The first category of problems highlighted in paragraph 5.199(a) relating to the basic integrity of the risk measurement model is potentially the most serious. If there are exceptions attributed to this category for a particular trading unit, the plus factor set out in **Table 13** will apply. In addition, the model may necessitate review and/or adjustment, and the Bank will require the banking institution to make the appropriate corrections.

5.199 The second category of problem highlighted in paragraph 5.199(b) is one that can be expected to occur at least some of the time with most risk measurement models. All models involve some amount of approximation. If, however, a particular banking institution's model appears more prone to this type of problem than others, the Bank may impose the plus factor and require the banking institution to improve its risk measurement techniques.

5.200 The third category of problem highlighted in paragraph 5.199(c) should also be expected to occur at least some of the time with VaR models. The behaviour of the markets may shift so that previous estimates of volatility and correlation are less appropriate. No VaR model will be immune to this type of problem; it is inherent in the reliance on past market behaviour as a

means of gauging the risk of future market movements. Exceptions for such reasons do not suggest a problem. However, if the shifts in volatilities and/or correlations are deemed to be permanent, the Bank may require banking institution to recalculate its VaR using volatilities and correlations based on a shorter historical observation period.

5.201 Finally, depending on the definition of trading outcomes employed for the purpose of back testing, exceptions could also be generated by intra-day trading results or an unusual event in trading income other than from positioning. Although exceptions for these reasons would not necessarily suggest problem with banking institution's VaR model, it could still be a cause for concern and the imposition of the plus factor might be considered.

5.202 The extent to which trading outcome exceeds the risk measure is another relevant piece of information. Exceptions generated by trading outcomes far in excess of the risk measure are a matter of greater concern, than outcomes slightly larger than the risk measure.

The Red Zone

5.203 In contrast to the yellow zone, where the Bank may exercise judgement in interpreting the back testing results, outcomes in the red zone (ten or more exceptions) will generally lead to an automatic presumption that a problem exists with banking institution's model. This is because it is extremely unlikely that an accurate model would independently generate ten or more exceptions from a sample of 250 trading outcomes.

5.204 In general, therefore, if a banking institution's model falls into the red zone, the Bank will automatically increase the scaling factor applicable to the model by one. The Bank will also investigate the reasons why banking institution's model produced such a large number of exceptions, and will require the banking institution to begin work on improving its internal model immediately. Finally, in the case of severe problems with the basic

integrity of the model, the Bank may disallow the use of the banking institution's model for capital adequacy purposes.

5.205 Although ten exceptions is a very high number for 250 observations, there may, on very rare occasions, be a valid reason why an accurate model will produce so many exceptions. In particular, when financial markets are subjected to a major regime shift, many volatilities and correlations can be expected to shift as well, perhaps substantially. Such a regime shift could generate a number of exceptions in a short period of time. One possible response in this instance may be to simply require banking institution's model to take account of the regime shift as quickly as it can while maintaining the integrity of its procedures for updating the model. This exception will be allowed only under the most extraordinary circumstances.

PART E LARGE EXPOSURE RISK REQUIREMENTS

E.1 LERR FOR BANKING INSTITUTIONS

6.1 A banking institution shall compute its Large Exposure Risk Requirement (LERR) in relation to its holding of equities (excluding the holdings of units of unit trust funds).

6.2 The LERR for a single equity capital charge shall be applied at all times on an exposure to a single equity that is greater than either the lower of 15% of the banking institution's Total Capital or 10% of the issuer's paid-up capital. For equity positions held in the trading book, the capital charge is determined by multiplying the market value of the equity position in excess of the threshold, with the sum of the corresponding general and specific risk weights outlined in the market risk component of the Capital Adequacy Framework. For positions held in the banking book, the capital charge is determined by multiplying the value in excess of the threshold with the corresponding risk weight (i.e. 100%). For trading book exposures, the LERR capital charge shall be multiplied by a factor of 12.5 to arrive at a risk-weighted asset equivalent. An illustration for the calculation of LERR is given in **Appendix XVIII**.

6.3 Shares and interest-in-shares that are acquired as a result of underwriting commitments, debt satisfaction and debt-equity conversions shall be subject to the LERR capital charge only if the shares and interest-in-shares remain with the banking institution after 12 months from the date of acquisition or conversion.

E.2 LERR FOR INVESTMENT BANKS

6.4 For an investment bank, the exposure to a single equity[241] shall be computed by including the market value of the equity from the following positions:

i) The investment banks' own proprietary equity positions; and

ii) Net purchase contract value of single equity underlying clients' accounts arising from transactions either under a Ready or Immediate Basis Contract, to the extent that it has not been paid for on and subsequent to the settlement date due.

6.5 Therefore, in addition to the requirement in Part E.1, LERR shall also be computed in relation to an investment bank's exposure to a single counterparty[242] arising from unsettled trades and free deliveries in the normal course of trading in equity securities that are greater than 10% of the investment bank's Total Capital. The LERR capital charge is equivalent to the corresponding counterparty risk requirement (CRR) calculated as per paragraph 8 of Appendix IX.

6.6 Equity exposures which have been deducted in the computation of regulatory capital or subjected to a risk weight of 1250% will not be included in the computation of LERR capital charge.

---

[241] Shall also include an equity OTC option or equity warrant that is in the money at its full underlying value.

[242] A single counterparty includes:

i. Where a counterparty is an individual, the individual, spouse of the individual, the partnership of which he is a partner, any partner of the individual, the spouse of the partner and all companies/corporations over which the individual exercises control. For purposes of this framework, an individual is deemed to exercise 'control' over a company/corporation if the individual or the individual's spouse, severally or jointly:
   - Holds, directly or indirectly, more than 50% of the shares of the corporation,
   - Has the power to appoint, or cause to be appointed, a majority of the directors of the company or corporation, or
   - Has the power to make, cause to be made, decisions in respect of the business or administration of the company or corporation, and to give effect to such decisions, or cause them to be given effect to.

ii. Where a counterparty is a company or corporation, the company or corporation, its related company or corporation and its associated companies.

PART F SECURITISATION FRAMEWORK

F.1 INTRODUCTION

7.1 The Securitisation Framework outlines:

i) the approaches in determining regulatory capital requirements on exposures arising from traditional and synthetic securitisations[243] held in the banking book; and

ii) the operational requirements for allowing regulatory capital relief for originating banking institutions.

7.2 Under the Securitisation Framework, all banking institutions, whether acting as originators or as third-party investors, must hold regulatory capital against all securitisation exposures (on- or off-balance sheet) in the banking book[244] arising from traditional and synthetic securitisations or structures that contain features similar to both[245], hereinafter referred to as 'securitisation exposures'. Such securitisation exposures may arise from a banking institution's:

i) investments in any securitisation issue, including retention or repurchase of one or more securitisation positions;

ii) provision of credit risk mitigants or credit enhancement to parties to securitisation transactions;

iii) provision of liquidity facilities or other similar facilities;

iv) obligations due to early amortisation features in a securitisation; or

v) entitlements to future income generated by a securitisation through various forms of arrangements such as deferred purchase price, excess servicing income, gain-on-sale, future margin income, cash collateral accounts or other similar arrangements.

---

[243] Or similar structures that contain features common to both, including Islamic securitisations. Pending the development of a framework for Islamic securitisation transactions, this Securitisation Framework will similarly apply to Shariah-compliant securitisation exposures, where applicable.

[244] Securitisation exposures held in the trading book are subject to interest/profit rate risk charges (specific and general risks) as outlined in the market risk component of the Capital Adequacy Framework (Basel II – Risk-Weighted Assets).

[245] For example, a collateralised debt obligation (CDO) that includes a credit-linked note issued out of another synthetic securitisation transaction is considered a structure which contains features of both traditional and synthetic securitisations.

7.3 The Securitisation Framework outlines two approaches, namely for banking institutions adopting the Standardised Approach for credit risk (**Part F.3**) and for banking institutions adopting the IRB approach (**Part F.4** – to be issued later).

7.4 As securitisations may be structured in different ways, capital treatments should be applied based on the economic substance or actual risk profile of a particular securitisation exposure rather than the legal form. This ensures that capital provided is commensurate with the underlying risk borne by banking institutions. The capital treatment under the Securitisation Framework shall apply to both conventional securitisation exposure and asset-backed sukuk held by banking institutions. For exposures where the economic substance or actual risk profile of a transaction is akin to a corporate exposure or exposures to asset-based sukuk, the capital treatment under the Standardised Approach for credit risk (**Part B.2**) shall apply. Definitions and general descriptions of terms used in the Securitisation Framework are provided in **Appendix XX**.

7.5 Where there are doubts about the appropriate treatment of a particular exposure for regulatory capital purposes, banking institutions should consult the Bank. For complex securitisation products such as CDO^2 and single-tranche CDO, where the capital treatment under this framework may not be appropriate, the Bank may specify a separate treatment on a case-by-case basis.

7.6 In entering into any securitisation transactions, banking institutions are also expected to comply with the expectations set out in the *Prudential Standards on Securitisation Transactions* and other applicable regulatory requirements and guidelines. Specific legal requirements under BAFIA and regulatory processes relating to securitisation transactions are summarised in **Appendix XXI**.

F.2 OPERATIONAL REQUIREMENTS FOR CAPITAL RELIEF

7.7 Under the Securitisation Framework, regulatory capital relief is granted based on the assessment of whether risks under a securitisation transaction have been effectively and significantly transferred. The extent to which securitisation exposures are retained through arrangements during the life of the transaction such as the provision of unconditional liquidity facilities will also be considered. The operational requirements for such capital relief are detailed in paragraphs 7.10 and 7.11. An originating banking institution may, upon receiving written approval for capital relief from the Bank[246], exclude the underlying assets that have been securitised (securitised exposures), whether from the banking book or trading book, from the calculation of risk-weighted assets or reduce the capital requirement using credit risk mitigation (CRM) techniques in accordance with **Part B.2.5**. Originating banking institutions must still hold regulatory capital for any securitisation exposures retained.

7.8 Failure to meet any of the operational requirements referred to in paragraphs 7.10 and 7.11 would result in originating banking institutions having to hold regulatory capital for all of the underlying securitised exposures, as if the underlying exposures had not been securitised. Should this apply, originating banking institutions need not hold additional regulatory capital for the securitisation exposures retained.

7.9 Notwithstanding any capital relief granted, an originating banking institution is expected to monitor and control risks arising from the continued retention of the securitised exposures (e.g. as provider of liquidity facility). This should include the continuing assessment of any change in the risk profile of the transaction and the resulting impact on capital arising from the banking institution's role in the transaction. Corresponding contingency plans to deal with the risk and capital impact must be put in place.

[246] Applications for capital relief should be submitted to the Bank in accordance with the requirements outlined in **Appendix XXI** "Application for Capital Relief".

F.2.1 Operational Requirements for Traditional Securitisations

7.10 An originating banking institution may exclude an underlying pool of exposures from the calculation of capital requirements, if all the following requirements are met on an ongoing basis:

a) Significant credit risk associated with the securitised exposures has been transferred to third parties[247].

b) The originating banking institution does not maintain effective or indirect control over the transferred exposures. The assets are legally isolated[248] from the originating banking institution in a manner (e.g. through the sale of assets or through sub-participation) that the exposures are beyond the reach of the originating banking institution and its creditors, even in bankruptcy or receivership. These conditions must be supported by an opinion provided by a qualified legal counsel[249]. The originating banking institution is deemed to have maintained effective or indirect control over the transferred credit risk exposures if it is:

i) able to repurchase from the transferee (i.e. SPV) the previously transferred exposures in order to realise their benefits; or

ii) obligated to retain the risk of the transferred exposures. The originating banking institution's retention of servicing rights to the exposures will not necessarily constitute indirect control of the exposures.

c) The securities issued are not obligations of the originating banking institution. Thus, investors who purchase the securities have recourse only to the underlying pool of exposures.

---

247 For the purpose of the Securitisation Framework, with the exception of SPVs, entities in which the consolidated treatment is applied for capital adequacy purposes, as outlined in Capital Adequacy Framework (Capital Components) are not included within the definition of a third-party.

248 Examples of methods of legal transfer normally adopted in traditional securitisation transaction are provided in **Appendix XX**.

249 For this purpose, both internal and external legal counsels are acceptable. Nevertheless, the Bank may, at its discretion require an additional legal opinion from an independent counsel where a second opinion is appropriate.

d) The transferee is a special purpose vehicle (SPV) and the holders of the beneficial interests in that entity have the right to pledge or exchange the interests without restriction.

e) The securitisation does not contain clauses that:

i) require the originating banking institution to alter systematically the underlying exposures to improve the credit quality of the pool;

ii) allow for increases in a retained first loss position or credit enhancement provided by the originating banking institution after the inception of the transaction; or

iii) increase the yield payable to parties other than the originating banking institution, such as investors and third-party providers of credit enhancements, in response to a deterioration in the credit quality of the underlying pool.

f) Clean-up calls, if any, satisfy the conditions set out in **Part F.5.1**.

F.2.2 Operational Requirements for Synthetic Securitisations

7.11 An originating banking institution may recognise the use of CRM[250] techniques such as collateral[251], guarantees or credit derivatives[252] in a synthetic securitisation for capital relief purpose, if all the following requirements are met on an ongoing basis:

a) Significant credit risk associated with the underlying exposure has been transferred to third parties[253].

b) The instruments used to transfer credit risk do not contain terms or conditions that limit the amount of credit risk transferred. Such clauses might include the following:

i) materially limiting the credit protection or credit risk transfer (e.g. pre-determined significant materiality thresholds where credit

[250] Use of CRM techniques must comply with the requirements as set out in **Part B.2.5**.

[251] Eligible collaterals are limited to that specified in paragraphs 2.105 and 2.106, including those that are pledged by SPVs.

[252] Eligible guarantors are defined in paragraph 2.148. Banking institutions may not recognise SPVs as eligible guarantors or credit protection providers in the Securitisation Framework.

[253] Refer to footnote 247.

protection is deemed not to be triggered even if a credit event occurs, or clauses that allow for the termination of the protection due to a deterioration in the credit quality of the underlying exposures);

ii) requiring the originating banking institution to alter the underlying exposures to improve the credit quality of the reference pool;

iii) increase in the banking institutions' cost of credit protection in response to a deterioration in the quality of the reference pool;

iv) increase in the yield payable to parties other than the originating banking institution, such as investors and third-party providers of credit enhancements, in response to a deterioration in the credit quality of the reference pool; and

v) provide for increases in a retained first loss position or credit enhancement provided by the originating banking institution after the inception of the transaction.

c) Securitisation structures that include a clean-up call feature must satisfy the conditions set out in **Part F.5.1**.

d) A written opinion is obtained from a qualified legal counsel that confirms the enforceability of the contracts in all relevant jurisdictions[254].

7.12 **Part B.2.5** provides the capital treatment for banking institutions using CRM techniques to hedge underlying exposures and the treatment of any maturity mismatches[255] arising from synthetic securitisations. In particular, the maturity mismatch treatment set forth in paragraphs 2.155 to 2.158 must be applied. In cases where the exposures in the underlying pool have different maturities, the longest maturity shall be taken as the maturity of the pool.

[254] Refer to footnote 249.

[255] Maturity mismatches may arise in the context of synthetic securitisations when for example, a banking institution uses credit derivatives to transfer part or all of the credit risk of a specific pool of assets to third parties. When the credit derivatives unwind, the transaction will terminate. This implies that the effective maturity of the tranches of the synthetic securitisation may differ from that of the underlying exposures.

F.3 STANDARDISED APPROACH FOR SECURITISATION EXPOSURES

F.3.1 TREATMENT OF ON-BALANCE SHEET SECURITISATION EXPOSURES

7.13 The risk-weighted asset amount of an on-balance sheet securitisation exposure is computed by multiplying the amount of the securitisation exposure by the appropriate risk weight provided in the tables "Securitisations" and "Securitisations (Short term ratings)" in **Appendix III**.

7.14 Originating banking institutions that retain their own-originated securitisation positions rated below investment grade must apply a 1250% risk weight on all of such exposures. Holdings of non-investment grade securitisation exposures, however, will not be subject to the 1250% risk weight if the originating banking institution does not also retain the first loss position (in whole or in part) of its own securitisation. In this case, the corresponding risk weight as provided in the tables mentioned in paragraph 7.13 shall be used.

7.15 The 1250% risk weighting imposed on unrated securitisation exposures, as indicated in **Appendix III** will not apply in the following circumstances:

A. Unrated most senior securitisation exposures

Where a banking institution that holds or guarantees the most senior exposure in a traditional or synthetic securitisation applies the 'look-through' approach in determining the average risk weight of the underlying exposure, the unrated exposures should be subject to the average risk weight[256]. However, if the resulting weighted average risk weight is higher than the risk weight of the securitisation exposure below it, then the risk weight of the latter shall apply.

[256] Banking institutions must be able to demonstrate that the composition of the underlying pool and the relevant risk weight of each individual exposure within the pool are quantifiable at all times.

B. Unrated securitisation exposures in a second loss or better position under an ABCP programme

Unrated securitisation exposures held by a banking institution to an ABCP programme will be subject to a risk weight which is the higher of 100% or the highest risk weight assigned to any of the underlying individual exposures covered by the facility, subject to the following requirements:

i) the exposure is economically in a second loss position or better and the first loss position provides significant credit protection[257] to the second loss position;

ii) the associated credit risk is the equivalent of investment grade or better[258]; and

iii) the banking institution holding such unrated securitisation exposure does not also retain the first loss position in the ABCP program.

[257] As may be demonstrated by models and simulation techniques.

[258] As may be evidenced by an indicative rating provided by an internal model.

F.3.2 TREATMENT OF OFF-BALANCE SHEET SECURITISATION EXPOSURES

7.16 Off-balance sheet securitisation exposures must be translated into an on-balance sheet exposure equivalent amount by multiplying the exposure with a credit conversion factor (CCF). The resulting amount is then weighted according to the relevant risk weights.

7.17 The CCFs, which are determined based on whether the off-balance sheet securitisation exposure qualifies as an 'eligible liquidity facility', an 'eligible servicer cash advance facility' or 'eligible underwriting facility' according to the eligibility criteria specified in **Part F.5.3**, are as follows:

	CCF	Risk Weight
Treatment of eligible liquidity facilities		
a) Externally rated eligible liquidity facility that meets the operational requirements in paragraph 7.107 and the requirements for use of external rating in **Part F.5.4**.	100%	Rating-based risk weight in **Appendix III**.
b) Non-externally rated eligible liquidity facility with an original maturity of more than 1 year.	50%	Highest risk weight assigned to any of the underlying individual exposures covered by the facility.
c) Non-externally rated eligible liquidity facility with an original maturity of 1 year or less.	20%	
Treatment of eligible servicer cash advance facilities		
a) Eligible servicer cash advance facility that meets the operational requirements in paragraph 7.108.	0%	Not applicable
Treatment of eligible underwriting facility		
a) Eligible underwriting facility that meets the operational requirements in paragraph 7.109.	50%	Highest risk weight assigned to any tranche of the securitisation exposure underwritten
Others		
a) All other off-balance sheet securitisation exposures (including ineligible facilities), unless otherwise specified by the Bank.	100%	Highest risk weight assigned to any tranche of the securitisation exposure

F.3.3 TREATMENT OF OVERLAPPING EXPOSURES

7.18 A banking institution may provide several types of facilities (e.g. provision of a liquidity facility and a credit enhancement) in a securitisation transaction that can be drawn under various terms and conditions which may overlap with each other. Under circumstances where there is an explicit limit on the draw of more than one facility at a time for the overlapping exposure, capital should be provided as though the institution had only provided one facility for the overlapping exposures[259]. If the overlapping facilities are subject to different capital treatments, the treatment that results in the highest capital charge should be applied on the overlapping portion.

7.19 The treatment above does not apply in cases where the overlapping facilities are provided by two different banking institutions and capital is allocated by each individual institution.

F.3.4 TREATMENT OF COUNTERPARTY CREDIT RISK FOR SECURITISATION EXPOSURES

7.20 When an interest rate or currency swap is provided to a securitisation transaction and where the counterparty is an SPV, the credit equivalent amount is computed based on the current exposure method specified in **Appendix VIII**. The highest risk weight of the underlying assets in the pool shall be applied to the resultant exposure amount in determining the counterparty credit risk.

[259] For example, if a banking institution provides a credit enhancement covering 10% of the underlying asset pool in an ABCP programme and a liquidity facility covering 100% of the same underlying asset pool, the banking institution would be required to hold capital against 10% of the underlying asset pool for the credit enhancement it is providing and 90% of the liquidity facility provided to the underlying asset pool. Effectively, the overlapping portion between the credit enhancement portion and the liquidity facility portion would be subject to a capital treatment which results in the highest capital charges.

F.3.5 TREATMENT OF SECURITISATION OF REVOLVING UNDERLYING EXPOSURES WITH EARLY AMORTISATION PROVISIONS

7.21 Early amortisation provisions are mechanisms that, once triggered, allow investors to be paid out prior to the maturity of the securities subject to the terms of the securitisation transaction. Generally, early amortisations are triggered based upon the performance or selected risk indicators of the underlying exposures, such as the excess spread level. The existence of an early amortisation feature[260] in a securitisation transaction exposes an originating banking institution to liquidity risk if the securities issued are required to be prepaid early, for example where there is a significant reliance on securitisation to meet funding requirements.

7.22 Accordingly, originating banking institutions must hold capital against the risk exposure arising from the securitisation of revolving underlying exposures that contains an early amortisation feature. The specific capital treatment varies according to the type of early amortisation provision (i.e. controlled or non-controlled early amortisation) and type of underlying securitised exposures (i.e. committed or non-committed and retail or non-retail) as detailed below.

7.23 An originating banking institution is required to hold capital against all or a portion of the investors' interest (i.e. against both the drawn and undrawn balances related to the securitised exposures) when it sells revolving exposures into a structure that contains an early amortisation feature in the following manner:

Capital requirement for originating banking institutions
= (Investors' interest) x CCF x (Risk weight of underlying exposures)

[260] A clean-up call feature is distinguished from an early amortisation feature in this framework, where a clean-up call is exercised only under the conditions specified in paragraph 7.102. This supports the differentiated capital treatment for early amortisation and clean-up call features.

7.24 The total capital charge for all of its positions will be subject to a maximum capital requirement equal to the greater of:

a) the capital required for retained securitisation exposures; or

b) the capital requirement that would apply had the exposures not been securitised.

7.25 The specific credit conversion factors (CCFs) to be applied depend upon whether the early amortisation repays investors through a controlled or non-controlled mechanism.

7.26 For the purpose of the Securitisation Framework, a controlled early amortisation provision must meet all of the following conditions:

a) an appropriate capital or liquidity plan is in place to ensure that sufficient capital and liquidity is available in the event of an early amortisation;

b) interest, principal, expenses, losses and recoveries are shared on a pro-rata basis according to the banking institution's and investors' relative shares of the receivables outstanding at the beginning of each month. The same pro-rata share should be applied throughout the duration of the transaction, including the amortisation period;

c) a period for amortisation has been set, which should be sufficient for at least 90% of the total debt outstanding at the beginning of the early amortisation period to have been repaid or recognised as in default; and

d) the pace of repayment should not be any more rapid than would be allowed by straight-line amortisation over the period set out in criterion (c).

7.27 An early amortisation provision that does not satisfy the conditions above will be treated as a non-controlled early amortisation.

7.28 The CCFs to be applied depends on whether the securitised exposures are uncommitted retail credit lines (e.g. credit card receivables) or other

credit lines (e.g. revolving corporate facilities). A credit line is considered uncommitted if it is unconditionally cancellable without prior notice.

7.29 The capital requirement outlined in **Part F.3.5** does not apply under the following circumstances:

a) where the securitisation transaction includes a replenishment structure under which the replenished exposures are not revolving in nature and the early amortisation ends the ability of the originating banking institution to add new exposures;

b) where the transaction has features that mirror a term structure (i.e. where the risk on the underlying exposures does not return to the originating banking institution);

c) a structure where investors remain fully exposed to future drawings by borrowers in respect of the revolving underlying exposures even after an early amortisation event has occurred; and

d) the early amortisation clause is solely triggered by events not related to the performance of the securitised assets or the originating banking institution, such as material changes in tax laws or regulations.

Determination of CCFs for controlled early amortisation features

Uncommitted retail exposures

7.30 For uncommitted retail credit lines (e.g. credit card receivables) in securitisations containing controlled early amortisation features, banking institutions must compare the three-month average excess spread to the point at which the originating banking institution is required to trap excess spread as stipulated under the terms of the securitisation structure (i.e. excess spread trapping point).

7.31 In cases where such a transaction does not require excess spread to be trapped, the trapping point is deemed to be 4.5 percentage points.

7.32 Banking institutions must divide the excess spread level by the transaction's excess spread trapping point, to determine the appropriate segments and apply the corresponding CCF, as outlined in the following table.

Controlled early amortisation features

<table>
<tr><th></th><th colspan="2">Uncommitted</th><th>Committed</th></tr>
<tr><td rowspan="7">Retail credit lines</td><td colspan="2">3-month average excess spread
Credit Conversion Factor (CCF)</td><td rowspan="7">90% CCF</td></tr>
<tr><td>133.33% of trapping point or more</td><td>0% CCF</td></tr>
<tr><td>less than 133.33% to 100% of trapping point</td><td>1% CCF</td></tr>
<tr><td>less than 100% to 75% of trapping point</td><td>2% CCF</td></tr>
<tr><td>less than 75% to 50% of trapping point</td><td>10% CCF</td></tr>
<tr><td>less than 50% to 25% of trapping point</td><td>20% CCF</td></tr>
<tr><td>less than 25% of trapping point</td><td>40% CCF</td></tr>
<tr><td>Non-retail credit lines</td><td colspan="2">90% CCF</td><td>90% CCF</td></tr>
</table>

Other exposures

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

Determination of CCFs for non-controlled early amortisation features

7.34 Early amortisation features that do not satisfy the definition of a controlled early amortisation will be considered non-controlled and treated as follows:

Uncommitted retail exposures

7.35 For uncommitted retail credit lines (e.g. credit card receivables) in securitisations containing non-controlled early amortisation features, banking institutions must compare the three-month average excess spread to the point at which the banking institution is required to trap excess spread under the terms of the securitisation structure (i.e. excess spread trapping point). In

cases where such a transaction does not require excess spread to be trapped, the trapping point is deemed to be 4.5 percentage points. The excess spread level shall be divided by the transaction's excess spread trapping point to determine the appropriate segments and apply the corresponding credit conversion factors, as outlined in the following table.

Non-controlled early amortisation features

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

Other exposures

7.36 All other securitised revolving exposures (i.e. those that are committed and all non-retail exposures) with non-controlled early amortisation features will be subject to a CCF of 100% against the off-balance sheet exposures.

Pools comprising both revolving and term exposures

7.37 For securitisation structures wherein the underlying pool comprises both revolving and term exposures, the originating banking institution must apply the relevant early amortisation treatment to that portion of the underlying pool containing revolving exposures.

F.3.6 TREATMENT OF CREDIT RISK MITIGATION FOR SECURITISATION EXPOSURES

7.38 The requirements outlined in this section provide the treatment for banking institutions that:

a) obtain credit risk mitigants such as guarantees, credit derivatives, collateral and on-balance sheet netting to cover the credit risk of a securitisation exposure (e.g. an asset-backed securities tranche); and

b) provide such credit risk mitigation to a securitisation exposure.

7.39 When a banking institution other than an originating banking institution provides credit protection to a securitisation exposure, it must calculate the capital requirement on the covered exposure as if it were an investor in that securitisation. For example, if protection is provided to an unrated first loss position, a risk weight of 1250% shall be applied accordingly to such credit protection.

Guarantees and credit derivatives

7.40 Where guarantees or credit derivatives are provided by eligible entities[261], banking institutions may take into account such credit protection in calculating capital requirements for their securitisation exposures in accordance to CRM treatments specified in paragraphs 2.142 to 2.154.

Eligible collateral

7.41 Eligible collateral is limited to those recognised under paragraphs 2.105 and 2.106, including collateral that may be pledged by an SPV.

Maturity mismatches

7.42 Where a maturity mismatch exists in any credit risk mitigation for securitisation exposures, the capital requirement for the maturity mismatch as outlined in paragraphs 2.155 to 2.158 shall be applied. When the exposures being hedged have different maturities, the longest maturity must be used.

[261] Refer to footnote 252.

F.4 INTERNAL RATINGS-BASED APPROACH FOR SECURITISATION EXPOSURES

To be issued at a later date.

F.5 OTHER OPERATIONAL REQUIREMENTS

F.5.1 OPERATIONAL REQUIREMENTS AND TREATMENT OF CLEAN-UP CALLS

7.101 Certain securitisation transactions may incorporate a clean-up call feature. A clean-up call is an option that permits the securitisation exposures (e.g. asset-backed securities) to be called before all of the underlying exposures or securitisation exposures have been repaid. In the case of traditional securitisations, this is generally accomplished by repurchasing the remaining securitisation exposures once the pool balance or outstanding securities have fallen below some specified level that renders the securitisation uneconomical to continue. In the case of a synthetic transaction, the clean-up call is a clause in the securitisation documentation that provides an option to extinguish the credit protection.

7.102 In general, originating banking institutions are not required to set aside regulatory capital for the existence of a clean-up call, provided that all the following conditions are fully met:

a) The exercise of the clean-up call is not mandatory, in form or in substance, but rather is at the sole discretion of the originating banking institution;

b) The clean-up call is not structured to avoid allocating losses to credit enhancements or positions held by investors, or otherwise structured to provide a credit enhancement; and

c) The clean-up call is only exercisable when 10% or less of the original underlying portfolio or securities issued remains, or for synthetic securitisations, when 10% or less of the original reference portfolio value remains.

7.103 A clean-up call that does not meet all of the requirements above, hereinafter referred to as ‘non-eligible clean-up call’, shall be subject to the following treatment:

a) For a traditional securitisation, the underlying exposures must be treated as if the exposures were not securitised. Banking institutions should deduct in the calculation of CET1 Capital any income in equity capital resulting from a securitisation transaction, such as that associated with expected future margin income resulting in a gain-on-sale; and

b) For synthetic securitisations, the purchaser of protection must hold capital against the entire amount of the synthetically securitised exposures as if it had not benefited from any credit protection.

F.5.2 TREATMENT FOR IMPLICIT SUPPORT

7.104 Implicit support arises when a banking institution provides support to a securitisation beyond its predetermined contractual obligations. This implicit support increases market expectations that the banking institution might continue to provide future support to the securitisation, thereby understating the degree of risk transfer and the required level of regulatory capital by the banking institution.

7.105 Examples of implicit support include the purchase of deteriorating credit risk exposures from the underlying pool, the sale of discounted credit risk exposures into the pool of securitised credit risk exposures, the purchase of underlying exposures at above market price or an increase in the first loss position according to the deterioration of the underlying exposures.

7.106 Banking institutions should disclose to the Bank the nature of implicit support extended to a securitisation transaction. Where such implicit support is extended, the banking institution would be required to:

a) hold capital against all of the exposures associated with the securitisation transaction as if the exposures had not been securitised or as if the transaction did not benefit from any credit protection (in the case of synthetic securitisation);

b) deduct in the calculation of CET1 Capital any income in equity capital resulting from a securitisation transaction, such as that

associated with expected future margin income resulting in a gain-on-sale; and

c) disclose in the financial statement the details of the implicit support and its capital impact.

F.5.3 ELIGIBLE OFF-BALANCE SHEET SECURITISATION EXPOSURES

Eligible liquidity facilities

7.107 An off-balance sheet securitisation exposure can be classified as an eligible liquidity facility, if the following conditions are met:

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

b) The facility must be subject to an asset quality test that precludes it from being drawn to cover credit risk exposures that are in default as defined in **Appendix V**. In addition, if the exposures that a liquidity facility is required to fund are externally rated securities, the facility can only be used to fund such securities that are rated at least investment grade at the time of funding;

c) The facility cannot be drawn after all applicable (e.g. transaction-specific and programme-wide) credit enhancements from which the liquidity would benefit have been exhausted; and

d) Repayment of draws on the facility (e.g. cash flow generated from underlying assets acquired by the SPV) must not be subordinated to any interests of any note holder in the programme (e.g. ABCP programme) or subject to any deferral or waiver.

Eligible servicer cash advance facilities

7.108 Undrawn cash advances extended by a banking institution acting as a servicer of a securitisation, to facilitate an uninterrupted flow of payments

to investors, can be classified as an eligible servicer cash advance facility, if the following conditions are met:

a) the provision of such facilities must be contracted;

b) the undrawn cash advances or facilities must be unconditionally cancellable at the discretion of the servicer banking institution without prior notice;

c) the servicer is entitled to full reimbursement and this right is senior to other claims on cash flows from the underlying pool of exposures; and

d) such cash advances should not act as a credit enhancement to the securitisation.

Eligible underwriting facilities

7.109 An off-balance sheet securitisation exposure can be classified as an eligible underwriting facility, if the following conditions are met:

a) the underwriting facility must be clearly documented with the specified amount and time period of the facility stipulated. The facility should be separated from any other facility provided by the banking institution;

b) the facility is cancellable at the discretion of the banking institution within a reasonable period of notice; and

c) a market exists for the type of underwritten securities.

F.5.4 REQUIREMENTS FOR USE OF EXTERNAL RATINGS

7.110 For risk-weighting of rated securitisation exposures, banking institutions are only allowed to use external ratings provided by ECAIs recognised by the Bank, as listed in **Appendix III**. In addition, banking institutions must ensure that the use of external ratings for risk-weighted capital adequacy purposes meets the following conditions:

a) The external rating is made publicly available i.e. a rating must be published in an accessible form. Credit ratings that are made available only to the parties to a securitisation transaction (e.g. rating on a particular securitisation exposure made available upon request by parties to the transaction) are not considered as a public rating for purposes of the Securitisation Framework;

b) The external rating is reflective of the entire amount of the banking institution's credit risk exposure with regard to all payments owed to it. For example, if a banking institution is owed both principal and interest, the assessment must fully take into account and reflect the credit risk associated with timely repayment of both principal and interest;

c) External ratings provided by the ECAIs are applied consistently across a given type of securitisation exposure. In particular, banking institutions are not allowed to use an ECAI's credit rating for one or more tranches and another ECAI's rating for other tranches within the same securitisation structure that may or may not be rated by the first ECAI. In cases where a securitisation exposure is rated by more than one ECAI, the requirements in paragraph 2.8 shall apply;

d) If CRM is provided directly to an SPV by an eligible guarantor[262] (i.e. eligible credit protection) and is reflected in the external rating assigned to a securitisation exposure, the risk weight associated with that external rating should be used. However, if the CRM provider is *not* an eligible guarantor, the rating for the 'guaranteed' securitisation exposure should not be recognised and the exposure

[262] Refer to footnote 252.

should be treated as unrated (except for securitisation exposures mentioned in paragraph 7.15); and

e) In the situation where CRM is applied to a specific securitisation exposure within a given structure (e.g. hedging a senior tranche exposure), banking institutions shall disregard the rating attached to the exposure and use the CRM treatment instead, as outlined in **Part B.2.5** to recognise the hedge. However, if the CRM becomes ineligible, the rating attached to the securitisation exposure should be used for risk-weighting purposes[263].

7.111 While the Capital Adequacy Framework primarily relies on external credit assessments, banking institutions must exercise prudence to ensure that the external credit assessments do not substitute for the banking institution's own due diligence in the credit assessment process. In order to use external ratings under the Securitisation Framework, a banking institution must have the following:

a) A comprehensive understanding of the risk characteristics of its individual securitisation exposures, whether on balance sheet or off-balance sheet, as well as the risk characteristics of the pools underlying the securitisation exposures. As part of their investment due diligence process, banking institutions should also consider the extent to which the originator or sponsor of the securitisation shares a similar economic interest as that of investors (for example, as indicated by the proportion of underlying exposures retained by the originator);

b) A thorough understanding of all structural features of a securitisation transaction that would materially impact the nature of the banking institution's exposures to the transaction, such as the contractual waterfall and waterfall-related triggers, credit

[263] For example, when a banking institution is investing in a BBB-rated ABS tranche and subsequently hedges the investment using CDS with an eligible counterparty under the framework, the rating-based risk weight for the ABS tranche shall be disapplied and the CRM treatment shall be used instead. However, if the CRM provider is ineligible under the framework, the banking institution shall fall back to the ratings-based capital treatment.

enhancements, liquidity enhancements, market value triggers, and deal-specific definitions of default; and

c) Access to performance information on the underlying pools on an ongoing basis in a timely manner. Such information may include, as appropriate: exposure type; percentage of loans 30, 60 and 90 days past due; default rates; prepayment rates; loans in foreclosure; property type; occupancy; average credit score or other measures of credit worthiness; average loan-to-value ratio; and industry and geographic diversification. For re-securitisations, banking institutions should have information not only on the underlying securitisation tranches, such as the issuer name and credit quality, but also on the characteristics and performance of the pools underlying the securitisation tranches.

PART G REQUIREMENTS FOR APPROVED FINANCIAL HOLDING COMPANIES

G.1 GENERAL REQUIREMENTS

8.1 Except for the requirements in paragraph 1.9(i), all other requirements in this policy document[264] shall be applicable to financial holding companies that hold investment directly or indirectly in corporations that are engaged predominantly in banking business.

8.2 References to banking institution(s) in this document shall also refer to approved financial holding company (-ies), as the case may be.

G.2 Regulatory approval process for the adoption of an advanced approach

8.3 A financial holding company is required to obtain the Bank's written approval prior to adopting any of the following advanced approaches:

i) Internal Ratings-based Approach for credit risk;

ii) Internal Model Approach for market risk; and

iii) The Standardised Approach or Alternative Standardised Approach for operational risk.

8.4 Where a Malaysian licensed bank within a financial group adopts an advanced approach for the computation of risk-weighted assets of a risk type, the financial holding company shall apply a similar approach for the computation of the group risk-weighted assets of that risk type[265,266]. This will ensure a consistent measurement approach applied for similar exposures across the group.

[264] This includes the reporting templates and reporting manual.

[265] For credit risk, the adoption of the advanced approach can be done based on an asset class or a sub-class, and for market risk, the adoption of the advanced approach can be done based on a broad risk category.

[266] For clarity, the other banking subsidiaries do not necessarily have to adopt the similar approach for their entity level reporting.

8.5 For the purpose of submitting an application to adopt the Internal Ratings-Based Approach for credit risk:

i) for a financial group where the Malaysian licensed bank within the group has adopted the Internal Ratings-Based Approach prior to 23 October 2014[267]:

a. the group must fully comply with all minimum requirements of the approach on a consolidated basis by 1 January 2019;

b. the group must submit the application, accompanied by all required information, to the Bank by 1 January 2017[268];

c. the Bank will inform its decision on the application and the commencement of observation period[269] by 31 December 2017; and

d. the Bank will inform its final decision on the migration to the approach before 1 January 2019.

ii) for a financial group where the Malaysian licensed bank within the group is planning to migrate to the Internal Rating-Based Approach for credit risk after 23 October 2014:

a. the group shall formally notify the Bank of its intention to migrate at least 3 years before the intended implementation date;

b. the group must submit the application, accompanied by all required information, to the Bank at least 2 years before the intended implementation date;

c. the group shall comply with all minimum requirements of the approach except in relation to the use of internal ratings, at the time of submission to the Bank under (b) above. In the case of the requirements on the use of internal ratings, the group shall demonstrate a credible track record showing that the rating

[267] Discussion paper on *Capital Adequacy Framework for Financial Holding Companies (Banking groups)* issued on 23 October 2014.

[268] For clarity, compliance with the minimum requirements of the approach is not required at the time of submission of the required information to the Bank. The group may utilise the time allocated for the review period by the Bank and the observation period to fully meet the minimum requirements by 1 January 2019.

[269] The observation period is intended to ensure that the models developed comply with the minimum requirements.

systems which comply with the minimum requirements have been used for at least 1 year prior to the submission. The group may utilise the time allocated for the review period by the Bank and the observation period to fully meet the use of internal ratings requirements[270];

d. the Bank will inform its decision on the application and whether the group can commence observation period within 1 year from the receipt of the submission of the required information under (b) above; and

e. in the case where the Bank has agreed for the group to commence observation period, the Bank will inform its final decision on the migration to the approach by the end of the observation period.

[270] As required in paragraph 3.375.

APPENDICES

Appendix I Areas of National Discretion

Paragraph in Basel document	Areas of National Discretion	Treatment
B.1. Standardised Approach for Credit Risk		
54	Lower risk weight to claims on sovereign (or central bank) in domestic currency if funded in that currency (Treatment where other supervisors have accorded)	Apply 0% risk weight for exposures to Malaysian government and the Bank.
55	Recognition of Export Credit Agencies' assessments	Not recognised
57	Claims on domestic PSEs as if banking institutions	Domestic PSEs accorded 20% if criteria specified under paragraph 2.19 met. Else treated as corporates.
58	Claims on domestic PSEs as if sovereigns (Treatment if other regulators adopt preferential treatment)	Not exercised.
60-64	Claims on banking institutions: Option 1, risk weight one category less than sovereign; Option 2, risk weight on the banking institution's external credit assessment	Option 2 applied.
64	Preferential risk weight treatment for claims on banking institutions with an original maturity of 3 months or less and denominated and funded in the domestic currency	Exercised.
65	Allow securities firms to be treated similarly as banking institutions	Not exercised. Securities firms to be treated as corporates.
67	Increase standard risk weight for unrated claims when a higher risk weight is warranted by the default experience in their jurisdiction	The Bank has accorded a 100% risk weight for unrated corporates.
68	To risk weight all corporate claims at 100% without regard to external ratings	Not exercised.
69	Definition of claims included in regulatory retail portfolio	Definition provided under paragraph 2.29.
70	Granularity criterion for the retail portfolio, limit of 0.2% of the overall retail portfolio	0.2% threshold applied.
71	To increase risk weights for regulatory retail	Risk weight

Paragraph in Basel document	Areas of National Discretion	Treatment
	exposures	maintained at 75%.
72	Definition of claims secured by residential mortgages	Definition provided under paragraph 2.31.
72-73	To increase preferential risk weights for claims secured by residential properties	Risk weights for residential mortgages subject to above criteria and dependent on exposure loan-to-value ratio.
74 (Footnote (FN) 25)	Commercial real estate 50% risk weight only if strict conditions are met	Not exercised.
75 & 78	Risk weight for the unsecured portion of a loan past due, net of specific provisions, reduced to 50% when specific provisions are more than 50%	Exercised.
75 (FN 26)	Past due treatment for non past due loans to counterparties subject to a 150% risk weight	Exercised
76 (FN 27)	Transitional period of three years for recognition of a wider range of collateral for higher risk categories (past due assets)	Not exercised
77	If a past due loan is fully secured by other forms of collateral, a 100% risk weight may apply when provisions reach 15% of the outstanding amount	Not exercised.
80	150% or higher risk weight to other assets	List specified under paragraph 2.42.
81 (FN 28)	Risk weight gold bullion at 0%	Exercised.
92	Mapping External Credit Assessment Institutions' assessments to the risk weights	Not exercised. The Bank will undertake continuous monitoring of local ECAI's default experience to assess appropriateness of risk weights.
102 (FN 31)	Use a borrower's domestic currency rating for exposure in foreign exchange transactions when loan extended by a Multilateral Development Banks.	Exercised.
108	Use of unsolicited ratings	Not exercised.
201	Lower risk weight to claims guaranteed by the sovereign (or central bank), when denominated and funded in domestic	Exercised.

Paragraph in Basel document	Areas of National Discretion	Treatment
	currency	
711	Lower specific risk charge where government paper denominated in domestic currency is funded in same currency	Exercised.
154	Banking institution's internal haircut (H) for each category of security when debt securities are rated BBB-/A-3 or higher	Not exercised.
170 & 294	Banking institutions can apply a H=0 for certain types of repo-style transaction	Exercised.
171	Definition of core market participants	Sovereign, central banks and licensed banking institutions and Islamic banking institutions.
172	Follow other supervisors preferential treatments with regard to carve-out	Exercised.
178	Supervisors may allow banking institutions to use VAR approach for repo-style transactions	Exercised.
B.2. Internal Ratings-Based Approach for Credit Risk		
227-228	Definition of HVCRE	Exercised. Refer to paragraph 3.27.
231-232	Threshold and number of borrowers to be classified as ‘retail’.	Not exercised.
234 (c)	Threshold for exposures to be included in qualifying revolving retail exposures	Exercised. Threshold set at RM500,000 per individual or small business.
237	Exemption of certain hedged equity-like obligations where net position has little/no equity risk.	Not exercised.
238	Re-characterise debt obligations as equity.	Exercised on a case-by-case basis.
241-242	Allow use of top-down approach for purchased corporate receivables.	Exercised.
250	For foundation IRB banking institutions, the use of a foundation approach for HVCRE (where banking institution sets PD), but with use of a separate risk weighting formula.	Exercised.
251	For Advanced IRB banking institutions, the use of an advanced approach for HVCRE (where banking institution satisfies PD, LGD and EAD requirements), but with use of a	Exercised.

Paragraph in Basel document	Areas of National Discretion	Treatment
	separate risk weighting formula.	
257	Phased rollout of IRB across business units, across asset classes in the same business unit and moving from foundation to advanced IRB for certain components (e.g. EAD and not LGD)	Exercised.
259	Permanent exemption of certain asset classes or units with immaterial exposures or risk profiles	Exercised. Permanent exemption for: ▪ Immaterial exposures (defined as aggregate credit RWA of less than or equal to 15% at group and entity level); ▪ Sovereign, central banks, banking institutions and PSEs; ▪ Equity holdings in institutions whose debt qualifies for 0% risk weight under standardised approach; ▪ Immaterial equity holdings on a case-by-case basis; ▪ Equity investments called for by the Federal Government of Malaysia, Bank Negara Malaysia, Association of Banks in Malaysia, Association of Islamic Banking Institutions in Malaysia, or Malaysian Investment Banking Association

Paragraph in Basel document	Areas of National Discretion	Treatment
		(subject to limit of 10% of Total Capital). Temporary exemption for: ▪ Additional aggregate credit RWA up to 10% during the transition period.
264-265	Transitional arrangements	Exercised. Flexibility is granted for the following requirements at the start of the transition period: ▪ Five year data requirement, reduced to two years ▪ Three years of use test requirement, reduced to one year.
267	Ten year exemption for equity holding at the point of implementation.	Not exercised.
277	Preferential UL risk weights for 'strong' and 'good' SL exposures provided remaining maturity < 2.5 years or where internal underwriting standards more risk averse than the supervisory slotting criteria	Exercised.
282 (and 379)	Preferential UL and EL risk weights to HVCRE exposures falling into 'strong' and 'good' SSC categories.	Not exercised.
288	Inclusion of 'economic subordination' in the definition of subordinated claims	Not exercised.
294	Removal of hair-cut for core market participants in certain repo-style transactions.	Exercised.
318	Foundation IRB banking institutions to measure effective maturity for each facility, as opposed to using the standard 2.5 years.	Exercised on a case-by-case basis.
319	Exemption of exposures to smaller firms from the maturity framework	Not exercised.
321-323	Exemption of certain short-term exposures from the maturity floor of one year	Exercised. Exemption for facilities below

Paragraph in Basel document	Areas of National Discretion	Treatment
		three months maturity.
341-343	Prescribe which approach, market-based or PD/LGD, will be used for equities exposure	Exercised on a case by case basis.
348	Allow a banking institution to use different market based approaches for different portfolios, subject to the Bank's approval	Exercised.
356	Exclude from treatment equity holdings in institutions whose debt qualifies for a 0% risk weight	Exercised.
357	Exclude equity investments made under legislated programmes intended to promote certain sectors, subject to cap of 10% of Tier 1 + Tier 2	Exercised for equity investments called for by the Federal Government of Malaysia, Bank Negara Malaysia, Association of Banks in Malaysia, Association of Islamic Banking Institutions in Malaysia, or Malaysian Investment Banking Association.
358	Exclude equity exposures based on materiality (set at 10% of total Tier 1 + Tier 2, or 5% for very granular portfolios)	Exercised on a case-by-case basis.
373 (FN 85)	Allow recognition of guarantors that are internally rated and have PDs equivalent to BBB- or below (for the purposes of assessing dilution risk)	Exercised.
378	Preferential 'EL' risk weights applied to 'strong' or 'good' SL exposures	Exercised subject to conditions specified in paragraph 3.225.
383	Banks using both standardised approach and IRB approaches can use their own internal methods for allocating general provisions for recognition in capital.	Not exercised.
443	Require external audit of banking institution's rating systems and parameter estimation processes	Exercised on case-by-case basis.
451	Flexibility in data standards relating to data, collected prior to implementation date.	Exercised.
452 (FN 95)	Definition of default for retail and PSE to be set to 180 days past due.	Exercised for retail mortgages. 120 days for hire purchases under Hire Purchase

Paragraph in Basel document	Areas of National Discretion	Treatment
		Act. Not exercised for PSEs.
458	Specific guidance regarding the 're-ageing' of loans.	Exercised.
467	Require adjustment to risk parameters to reflect seasoning, particularly for newer or rapidly growing portfolios	Exercised.
508 (FN 92)	Recognise mortgages on multi-family residential real estate as eligible collateral under foundation IRB.	Exercised.
521	Under foundation IRB, recognition of certain other collateral (in addition to CRE/RRE, financial collateral, etc. already recognised)	Exercised. Other collateral recognised albeit without specification of collateral type.
C. Operational Risk		
650	Definition of gross income	Definition provided under paragraph 4.10 to 4.11.
652 (FN 97)	Allow a banking institution to use the alternative standardised approach	Yes.
654 (FN 98)	Treatment of negative gross income	Treatment provided under paragraph 4.13
663 (FN 101)	Impose criteria in paragraph 624 or non-internationally active banks using standardised approach.	Yes, required.

Appendix II Eligibility Criteria for External Credit Assessment Institution (ECAI) Recognition

Criterion 1: Objectivity of credit assessment methodology and process

The methodology and process for assigning credit ratings must be rigorous and systematic. Before being recognised by the Bank, an assessment methodology for the broad asset class for which recognition is sought must have been established for at least one year and preferably three years.

1. The objectivity of an ECAI's credit assessment methodology can be assessed on the following parameters:
   a) Any credit assessment methodology adopted by an ECAI must produce an informed and sound opinion of the creditworthiness of rated entities. The credit assessments must be based on all relevant information that is available at the time the assessments are issued;
   b) All qualitative and quantitative factors known to be relevant in determining the creditworthiness of the rated entities must be incorporated in the methodology;
   c) The ECAI's credit assessment methodologies and processes should provide a sufficient level of consistency and discriminate between different levels of risk to provide the basis for capital requirements under the Standardised Approach for credit risk; and
   d) Processes to ensure that consistent application of any credit assessment methodology should be in place such that equivalent credit assessments are given to identical rated entities or issuances, and that different analysts or rating committees working independently within the ECAI would assign equivalent credit ratings to a particular entity or issuance.

2. With regard to Islamic debt securities, the Bank expects that the ECAI has a documented methodology to identify and assess the inherent risk drivers peculiar to Islamic debt securities. Processes should also be in place to ensure consistency in the application of credit assessment methodologies of Islamic entities and issuances.

Criterion 2: Ongoing review of credit assessment methodology

The methodology for assigning credit ratings must be validated by the ECAI based on its historical experience. Before being recognised by the Bank, rigorous backtesting must have been established for at least one year and preferably three years.

3. The review process of the credit assessment methodology can be assessed on the following parameters:
    a) The process of validating the methodologies is based on historical experience. Quantitative validation will need to be based on the ECAI's credit assessments (the outputs of the methodology) rather than on the methodology itself;
    b) The quantitative assessment should confirm the stability of credit assessments as well as the discriminatory power and the stability of discriminatory power of credit assessments over time;
    c) Procedures should be in place to ensure that systematic rating errors highlighted by backtesting will be incorporated into credit assessment methodologies and rectified; and
    d) If sufficient data is available, the ECAI should undertake separate backtesting for each of the broad asset classes for which an ECAI is seeking recognition.

Criterion 3: Ongoing review of individual credit assessments

ECAIs are expected to conduct an ongoing review of the credit assessments. Such reviews shall take place after any material event in a rated entity or at least annually.

4. The ECAI must ensure that credit assessments remain consistent and robust over time and market conditions.

5. The ECAI must ensure that reliable processes that are able to detect changes in conditions surrounding a rated entity that are sufficiently material to alter its credit assessments are in place.

6. The ECAI must ensure that a credit assessment is indeed revised when the change in operating conditions is material enough to warrant a revision. Notwithstanding this, individual credit assessments must be reviewed at least annually.

Criterion 4: Independence

The ECAI should be independent and should not be subject to any pressures that may influence the rating. The assessment process should be as free as possible from any constraints that could arise in situations where the composition of the board or the shareholder structure of the assessment institution may be seen as creating a conflict of interest.

7. The rating methodologies and process of an ECAI must be free from any influence, which may affect its ability to conduct credit assessments.

8. There must also be procedures to ensure that its methodologies are free from any influences or constraints that may influence the credit assessments.

9. The ECAI must ensure that:
   a) it has adopted, monitored, and successfully applied internal procedures to ensure that all credit assessments are formulated in a consistent and objective manner, particularly in situations where conflicts of interest may arise and could threaten its objectivity; and
   b) it has mechanisms in place to identify actual and potential conflicts of interest and take reasonable measures to prevent, manage and eliminate them, so that they do not impair the production of independent, objective and high quality credit assessments.

10. Where an ECAI has additional business with rated entities (for example advisory services, data services, consulting services), the ECAI should also disclose to the Bank the nature of the services and the general nature of the compensation arrangements for the provision of these services.

11. The ECAI should maintain and document strict fire-walls on information sharing between their rating assignment teams and other business lines.

12. ECAIs should disclose any significant business relationships between ECAI employees and the rated entities.

Criterion 5: International access and transparency

The individual assessments should be available to both domestic and foreign institutions with legitimate interests and at equivalent terms. In addition, the general methodology used by the ECAI should be publicly available to allow all potential users to decide whether they are derived in a reasonable way.

13. This criterion is intended to create a level playing field by ensuring that all institutions having a 'legitimate interest' in an ECAI's credit assessments, in whatever jurisdiction, have equal and timely access to them.

14. ECAIs that wish to be recognised as eligible must make their credit assessments accessible at least to all institutions having a 'legitimate interest'. Institutions having a 'legitimate interest' are those institutions that need to calculate their regulatory capital requirements, and that intend to use the credit assessments of the respective ECAI for risk weighting purposes.

15. 'At equivalent terms' means that under the same economic circumstances, access to credit assessments should be provided on identical terms, without any undue price discrimination.

Criterion 6: Disclosure

An ECAI should use appropriate methods of disclosure to ensure public access to all material information. This is to allow all potential users to decide whether the assessments are derived in a reasonable way.

16. At a minimum, ECAIs should disclose the following to the public:

- the methodologies (these include the definition of default, the time horizon and the meaning of each rating);
- as promptly as possible, any material changes in methodology referred;
- the validation results on their methodology (these include the actual default rates experienced in each assessment category and the transitions of the assessments); and
- whether a credit assessment is unsolicited.

17. An ECAI should use appropriate methods of disclosure to ensure public access to the abovementioned information.

Criterion 7: Resources

An ECAI should have sufficient resources to carry out high quality credit assessments. These resources should allow for substantial ongoing contact with senior and operational levels within the entities assessed in order to add value to the credit assessments. Such assessments should be based on methodologies combining qualitative and quantitative approaches.

18. In terms of staffing and expertise, an ECAI should ensure that its staff has the levels of skills and experience necessary to perform the tasks required of them, competently and thoroughly.

19. The ECAI should also have sufficient resources to carry out consistent assessments and have frequent contacts with the rated companies.

20. In addition, analysts at ECAIs that rate Islamic issues need to have undergone sufficient training to develop the requisite understanding in rating Islamic issues and the specific risks contained in these issues.

Criterion 8: Credibility

The Bank shall verify that the ECAI's individual credit assessments are recognised in the market as credible and reliable by the users of such credit assessments.

21. The Bank shall assess the ECAI's credibility according to factors such as the following:
    - the extent to which it meets the overall recognition criteria;
    - the extent to which independent parties (investors, insurers, trading partners) rely on ECAI's assessment; and
    - the extent to which market prices of rated securities are differentiated according to the ECAI's ratings.

Appendix III Risk Weights and Rating Categories

Sovereigns and Central Banks

Rating Category	Standard & Poor's Rating Services (S&P)	Moody's Investors Service (Moody's)	Fitch Ratings (Fitch)	Rating and Investment Information, Inc. (R&I)[271]	Risk weight
1	AAA to AA-	Aaa toAa3	AAA to AA-	AAA to AA-	0%
2	A+ to A-	A1 to A3	A+ to A-	A+ to A-	20%
3	BBB+ to BBB-	Baa1 to Baa3	BBB+ to BBB-	BBB+ to BBB-	50%
4	BB+ to B-	Ba1 to B3	BB+ to B-	BB+ to B-	100%
5	CCC+ to D	Caa1 to C	CCC+ to D	CCC+ to C	150%
Unrated					100%

[271] External credit assessments produced by Rating and Investment Information, Inc. on Islamic debt securities are not recognised by the Bank in determining the risk weights for exposures to the asset classes listed in this Appendix.

Banking Institutions

Rating Category	S&P	Moody's	Fitch	R&I	RAM Rating Services Berhad (RAM)	Malaysian Rating Corporation Berhad (MARC)	Risk weight	Risk weight (original maturity of 6 months or less)[272]	Risk weight (original maturity of 3 months or less)[273]
1	AAA to AA-	Aaa to Aa3	AAA to AA-	AAA to AA-	AAA to AA3	AAA to AA-	20%	20%	20%
2	A+ to A-	A1 to A3	A+ to A-	A+ to A-	A1 to A3	A+ to A-	50%	20%	
3	BBB+ to BBB-	Baa1 to Baa3	BBB+ to BBB-	BBB+ to BBB-	BBB1 to BBB3	BBB+ to BBB-	50%	20%	
4	BB+ to B-	Ba1 to B3	BB+ to B-	BB+ to B-	BB1 to B3	BB+ to B-	100%	50%	
5	CCC+ to D	Caa1 to C	CCC+ to D	CCC+ to C	C1 to D	C+ to D	150%	150%	
Unrated							50%	20%	

Corporate

Rating Category	S&P	Moody's	Fitch	R&I	RAM	MARC	Risk weight
1	AAA to AA-	Aaa to Aa3	AAA to AA-	AAA to AA-	AAA to AA3	AAA to AA-	20%
2	A+ to A-	A1 to A3	A+ to A-	A+ to A-	A1 to A3	A+ to A-	50%
3	BBB+ to BB-	Baa1 to Ba3	BBB+ to BB-	BBB+ to BB-	BBB1 to BB3	BBB+ to BB-	100%
4	B+ to D	B1 to C	B+ to D	B+ to D	B1 to D	B+ to D	150%
Unrated							100%

[272] Short-term exposures on banking institutions are defined as exposures with an original maturity of six months or less. The preferential treatment is available for exposures to both rated and unrated banking institutions, but not for banking institutions rated below B-.

[273] This preferential risk weight is accorded to all interbank exposures with an original maturity of three months or less denominated and funded in RM.

Banking Institutions and Corporate (Short term ratings)

Rating Category	S&P	Moody's	Fitch	R&I	RAM	MARC	Risk weight
1	A-1	P-1	F1+, F1	a-1+, a-1	P-1	MARC-1	20%
2	A-2	P-2	F2	a-2	P-2	MARC-2	50%
3	A-3	P-3	F3	a-3	P-3	MARC-3	100%
4	Others	Others	B to D	b, c	NP	MARC-4	150%

Securitisations

Rating Category	S&P	Moody's	Fitch	R&I	RAM	MARC	Risk weight
1	AAA to AA-	Aaa to Aa3	AAA to AA-	AAA to AA-	AAA to AA3	AAA to AA-	20%
2	A+ to A-	A1 to A3	A+ to A-	A+ to A-	A1 to A3	A+ to A-	50%
3	BBB+ to BBB-	Baa1 to Baa3	BBB+ to BBB-	BBB+ to BBB-	BBB1 to BBB3	BBB+ to BBB-	100%
4	BB+ to BB-	Ba1 to Ba3	BB+ to BB-	BB+ to BB-	BB1 to BB3	BB+ to BB-	350%
5	B+ and below	B1 and below	B+ and below	B+ and below	B1 and below	B+ and below	1250%
Unrated							1250%

Securitisations (Short term ratings)

Rating Category	S&P	Moody's	Fitch	R&I	RAM	MARC	Risk weight
1	A-1	P-1	F1+, F1	a-1+, a-1	P-1	MARC-1	20%
2	A-2	P-2	F2	a-2	P-2	MARC-2	50%
3	A-3	P-3	F3	a-3	P-3	MARC-3	100%
4	Others or unrated	Others or unrated	Others or unrated	b, c	NP	MARC-4	1250%

For the risk weights in the tables "Securitisations" and "Securitisations (Short term ratings)" to be eligible for use under this framework, banking institutions should ensure that external ratings produced by external credit assessment institutions (ECAIs) meet the operational requirements outlined in **Part F.5.4**.

Appendix IV Summary of Risk Weights for Loans Secured by Residential Mortgages

	Risk weight	
	Performing	**Non-Performing***
Meets criteria in paragraph 2.31 and: loan-to-value ratio < 80%	35%	100%
loan-to-value ratio 80% - 90%	50%	100%
Does not meet criteria in paragraph 2.31 or loan-to-value ratio > 90% (approved and disbursed before 1 February 2011)	Treated as per paragraph 2.29	150%
All loans with loan-to-value ratio> 90% approved and disbursed on or after 1 February 2011	100%	150%
Priority sector lending:[274] loan-to-value ratio < 80%	35%	100%
loan-to-value ratio = or > 80%	50%	100%
loan-to-value ratio > 90% approved and disbursed on or after 1 February 2011	75%	150%
Residential mortgages combined with overdraft facilities: Residential mortgage	Dependent on criteria & loan-to-value ratio	
Overdraft facility	75% subject to meeting retail portfolio criteria	150%
Residential Mortgage loans on abandoned projects	150%	
*Risk weights could be lower depending on level of provisioning as per paragraphs 2.38 and 2.40		

[274] As per the requirements specified by the Bank.

Appendix V Definition of Default

1. A default is considered to have occurred when:
    - The banking institution considers that an obligor is "unlikely to repay" in full its credit obligations to the banking group, without recourse by the banking institution to actions such as realising security; or
    - The obligor has breached its contractual repayment schedule and is past due for more than 90 days on any material credit obligation to the banking group.
        a. Under national discretion, the Bank has elected to apply the definition of default on obligors that are past due for more than 120 days under the Hire-Purchase Act 1967 and default for residential mortgages past due for more than 180 days.
        b. For securities, a default occurs immediately upon breach of contractual repayment schedule.
        c. For overdrafts, a default occurs when the obligor has breached the approved limits for more than 90 days.
        d. Where repayments are scheduled on three months or longer, a default occurs immediately upon breach of contractual repayment schedule.

        However, banking institutions which adopt a more stringent definition of default internally are required to apply such internal definition for regulatory capital purposes.

2. Elements to be taken as an indication of unlikeliness to repay:
    - The banking institution ceases to accrue all or partially, revenue due from a credit obligation in accordance with the terms of the contract.
    - The banking institution is uncertain about the collectability of a credit obligation which has already been recognised as revenue and then treats the uncollectible amount as an expense.
    - The banking institution makes a charge off or an account-specific provision or impairment resulting from a significant perceived decline in credit quality subsequent to the banking institution taking on the

exposure. (Provisions on equity exposures set aside for price risk does not signal default).

- The banking institution sells the credit obligation at a material credit related economic loss. (For securities financing, when collateral is liquidated not due to the deterioration of an obligor's creditworthiness but due to a fall in the value of collateral to restore an agreed collateral coverage ratio and has been disclosed to the customer in writing at the inception of the facility should not be recorded as a default).
- The banking institution consents to a restructuring[275] of the credit obligation where this is likely to result in a diminished financial obligation caused by the material forgiveness, or postponement of principal, interest or (where relevant) fees. This constitutes a granting of a concession that the banking institution would not otherwise consider.
- The default of a related obligor. Banking institutions must review all related obligors in the same group to determine if that default is an indication of unlikeliness to repay by any other related obligor. Banking institutions must judge the degree of economic interdependence of the obligor towards its related entities.
- Acceleration of an obligation.
- An obligor is in significant financial difficulty. An indication could be a significant downgrade of an obligor's credit rating.
- Default by the obligor on credit obligations to other financial creditors, e.g., financial institutions or bondholders.
- The banking institution has filed for the obligor's bankruptcy or a similar order in respect of the obligor's credit obligation to the banking group.
- The obligor has sought or has been placed in bankruptcy or similar protection where this would avoid or delay repayment of the credit obligation to the banking group.

[275] Shall also include rescheduling of facilities.

Default at Facility Level

3. For retail exposures, banking institutions are allowed to apply the definition of default at facility level, rather than at obligor level. For example, an obligor might default on a credit card obligation and not on other retail obligations. However, banking institutions should be vigilant and consider cross-default of facilities of an obligor if it is representative of his incapacity to fulfill other obligations.

4. A default by a corporate borrower shall trigger a default on all of its other exposures.

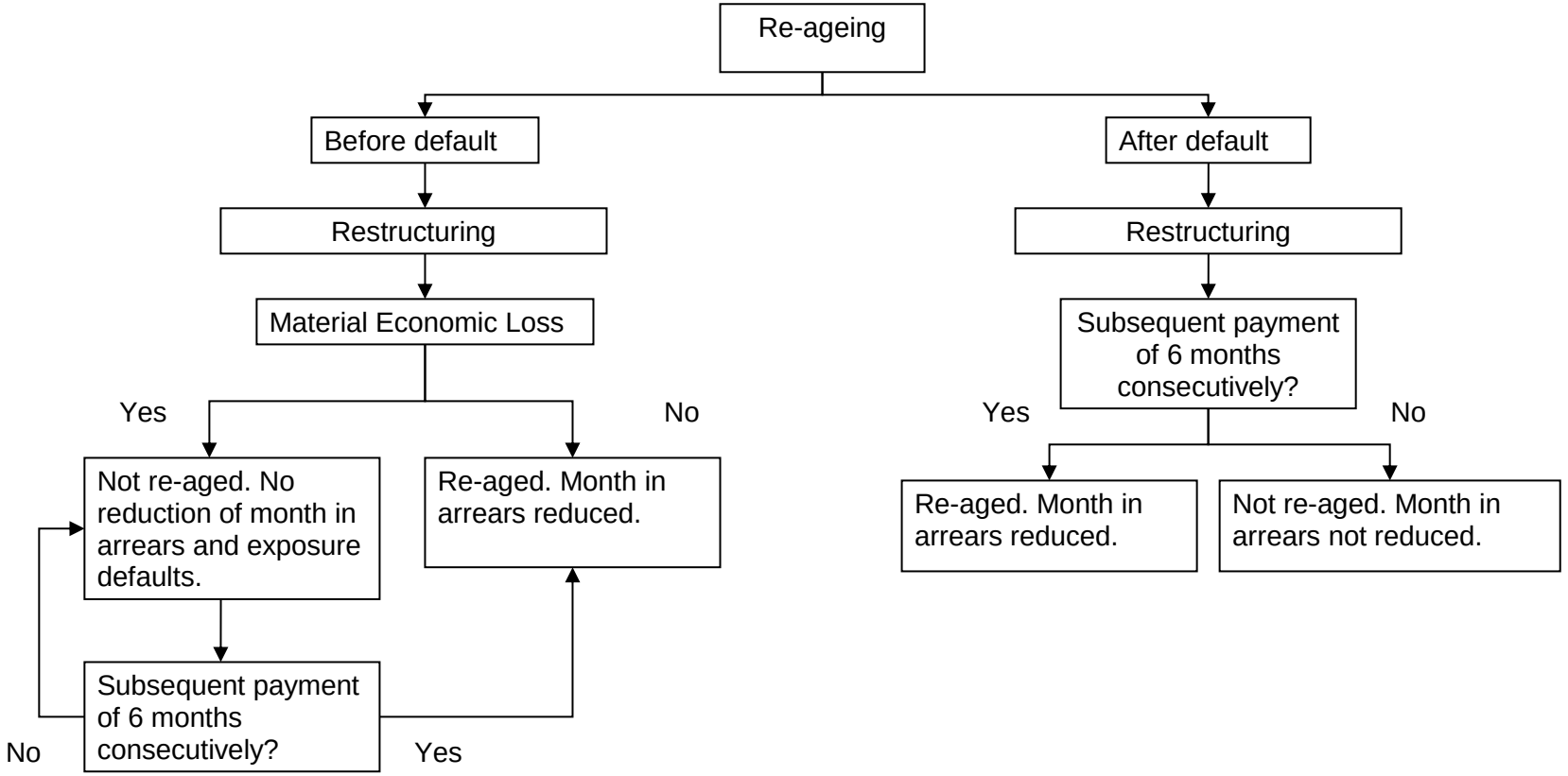
Re-Ageing

5. Re-ageing is a process by which banking institutions adjust the delinquency status of exposures based on subsequent repayment of arrears or restructuring. This is done when all or some of the arrears under the original repayment schedule have been paid off or repackaged into a new repayment structure.

6. At a minimum, the re-ageing policy of banking institutions must include:
    - appropriate approving authority and reporting requirements;
    - minimum age of a facility before it is eligible for re-ageing;
    - delinquency levels of facilities that are eligible for re-ageing
    - maximum number of re-ageing per facility; and
    - re-assessment of the borrower's capacity to repay.

7. Re-ageing is allowed for both defaulted and delinquent exposures. However, the exposure shall not be immediately re-aged if the restructuring causes a diminished financial obligation or material economic loss or it is assessed that the borrower does not have the capacity to repay under the new repayment structure. For defaulted exposures, re-ageing is permitted after the obligation has been serviced promptly for 6 months consecutively. For exposures with repayments scheduled at three months or longer, re-ageing is only permitted after the obligation has been serviced promptly for two consecutive payments. A diagrammatic illustration of re-ageing is given in **Appendix Va.**

Appendix Va Diagrammatic Illustration of Re-ageing via Restructuring



Note: Loans are still subject to assessment based on these criteria even if there has been a reduction in the month in arrears or re-classification of the loan from credit-impaired to non-credit-impaired under *Financial Reporting*.

Appendix VI Illustration on Risk-Weighted Asset (RWA) Calculation for Defaulted Exposures and Exposures Risk-Weighted at 150%

Example 1: Term loan

Defaulted loan to unrated corporate amounting to RM1,000,000 secured by eligible collateral (Haircut: 25%). The banking institution has already set aside specific provisions of RM50,000 for this loan.

Since specific provisions is only 5% of outstanding loan amount [i.e. RM50,000/RM1,000,000], the applicable risk weight charge is 150%. The computation of the RWA is as follows:

Collateral amount = RM500,000 x (100%-25%)

= RM375,000

RWA = 150% x unsecured portion of outstanding loan net of specific provisions

= 150% x (RM1,000,000 – RM375,000 – RM50,000)

= 150% x RM575,000

= **RM862,500**

Example 2: Qualifying and non-qualifying residential mortgage loan

Residential mortgage loan A amounting to RM95,000, with current value of property at RM100,000. The banking institution has already set aside specific provisions of RM10,000 for this loan.

Residential mortgage loan B amounting to RM75,000, with current value of property at RM100,000. The banking institution has already set aside specific provisions amounting to RM20,000 for this loan.

For loan A, the LTV ratio is 95%, thus would be deemed as non-qualifying. For loan B, as the LTV ratio is 75%, this category would fall under the qualifying residential mortgages loan category.

For qualifying residential mortgage loan portion:

As specific provisions over total outstanding loan amount exceeds 20% (20,000/75,000 = 26.67%), the exposure would be eligible for the preferential risk weight of 50%.

RWA = 50% x outstanding amount net of specific provisions

= 50% x (RM75,000 –RM20,000)

= 50% x RM55,000

= RM27,500

For non-qualifying residential mortgage loan portion:

As specific provisions over total outstanding loan amount is less than 20% (10,000/95,000 = 10.53%, the exposure would be accorded a risk weight of 150%.

RWA = 150% x outstanding amount net of specific provisions

= 150% x (RM95,000 –RM10,000)

= 150% x RM85,000

= RM127,500

Appendix VII Minimum Requirements on Supervisory Slotting Criteria Method

Introduction

1. The supervisory slotting criteria method requires banking institutions to map their internal rating to a set of supervisory criteria as per **Appendix VIIa**, in order to determine a supervisory category which is accorded with a specific risk weight. Once the supervisory slotting criteria method is adopted to compute credit risk-weighted asset for any or all of sub-classes under specialised lending/financing and investment, the method must be applied throughout *Istisna', Mushārakah* and *Mudārabah* contracts consistently.

2. Banking institutions are required to fulfill the minimum requirements as set out in the following parts before they are qualified to use the supervisory slotting criteria method to derive credit risk-weighted assets for *Istisna', Mushārakah* and *Mudārabah* contracts.

Definition of Specialised Lending/Financing and Investment

3. Specialised lending/financing and investment under the *Istisna', Mushārakah* and/or *Mudārabah* contracts shall be divided into five sub-classes, namely project finance (PF), object finance (OF), commodities finance (CF) and income-producing real estate (IPRE). In order for an exposure under these contracts to be classified as specialised lending/financing and investment, the exposures must meet the following general and specific criteria:

General Criteria

4. All specialised lending/financing and investment shall possess the following characteristics, either in legal form or economic substance:

   - The exposure is typically to an entity (often a special purpose entity (SPE)) which was created specifically to finance and/or operate physical assets. In specific, the SPE must have legal ownership of the assets;

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

Specific Criteria

5. In addition to the four general criteria, banking institutions are required to classify their exposures into one of the five sub-classes of specialised lending/financing based on the following broadly defined criteria:

a. Project finance

- Project finance (PF) is a method of funding in which banking institutions as the lenders look primarily to the revenues generated by a single project, both as the source of repayment and as security for the exposure. This type of lending/financing is usually for large, complex and expensive installations that might include, for example, power plants, chemical processing plants, mines, transportation infrastructure, environment, and telecommunications infrastructure. Project finance may take the form of lending/financing of the construction of a new capital installation, or refinancing of an existing installation, with or without improvements.
- In such transactions, the lenders are usually paid solely or almost exclusively out of the money generated by the contracts for the facility's output, such as the electricity sold by a power plant. The customer or borrower is usually an SPE that is not permitted to perform any function other than developing, owning, and operating the installation.

b. Object finance

- Object finance (OF) refers to a method of funding the acquisition of physical assets (for example ships, aircraft, satellites, railcars and fleets) where the repayment of the exposure is dependent on the cash flows generated by the specific assets that have been financed and pledged or assigned to the lenders. A primary source of these cash flows might be rental or lease contracts with one or several third parties.

c. Commodities finance

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

d. Income-producing real estate

- Income-producing real estate (IPRE) refers to a method of providing funding to real estate (such as, office buildings to let, retail space, residential houses, multifamily residential buildings, industrial or warehouse space, and hotels) where the prospects for repayment and recovery on the exposure depend primarily on the cash flows generated by the asset. The primary source of these cash flows would generally be lease or rental payments or the sale of the asset. The borrower may be, but is not required to be, an SPE, an operating company focused on real estate construction or

holdings, or an operating company with sources of revenue other than real estate. The distinguishing characteristic of IPRE versus other corporate exposures that are collateralised by real estate is the strong positive correlation between the prospects for repayment of the exposure and the prospects for recovery in the event of default, with both depending primarily on the cash flows generated by a property.

6. Banking institutions are required to put in place comprehensive policies and procedures to facilitate the differentiation process and ensure the consistent classification of specialised lending/financing and its sub-classes.

Minimum Requirements for the Use of Supervisory Slotting Criteria

7. Banking institutions intending to adopt the supervisory slotting criteria for the computation of capital requirements for specialised lending/financing must also fulfil the following requirements:

   a. Rating system and dimension

      - Banking institutions must use at least single rating dimension that reflects borrower strength and loss severity considerations.

   b. Rating structure

      - The rating system must have at least four internal grades for non-defaulted borrowers, and one for defaulted borrowers.

   c. Rating criteria

      - Specialised lending/financing and investment exposures must be assigned to internal rating grades based on the banking institutions' own criteria, systems and processes. The internal rating grades must then be mapped into five supervisory categories ("Strong" to "Default") using the supervisory slotting criteria provided in **Appendix VIIa.** The mapping must be

conducted separately for each sub-class of specialised financing exposures.

- The Bank recognises that the criteria used by banking institutions to assign exposures to their internal rating grades may not be perfectly aligned with criteria that are used to define the supervisory categories. However, the mapping process must result in an alignment of the internal rating grades consistent with the predominant characteristics in the respective supervisory category. Banks should ensure that any overrides of their internal criteria do not result in the mapping process being ineffective.
- Specifically, if a banking institution's internal rating grade maps specialised lending/financing exposure into two supervisory categories, the exposure should be assigned to the riskier supervisory category. For example, if the internal rating system produces one rating that describes criteria than can be slotted into both the supervisory "strong" and "fair" categories, the exposures should be slotted into the "fair" category.

d. Re-rating frequency and policy

- Banking institutions must conduct re-rating of exposures on a frequent basis and at minimum once per year. For this purpose, banking institutions must establish written policies and procedures on re-rating, including the trigger criteria for re-rating and its frequency.

e. Data maintenance

- Banking institutions are expected to collect and retain the relevant data used to derive the internal rating grades, for example, data on realised losses to facilitate the future review of the specialised lending/financing portfolio.

Appendix VIIa Supervisory Slotting Criteria for Specialised Lending/Financing Exposures

Project Finance Exposure

No.	Criteria	Strong	Good	Satisfactory	Weak
1.	**Financial strength**				
a.	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 worsened than average location, cost, or technology. Demand is weak and declining
b.	Financial ratios (for example *debt service coverage ratio (DSCR), loan life coverage ratio (LLCR), project life coverage ratio (PLCR), and debt-to equity ratio*)	Strong financial ratios considering the level of project risk; very robust economic assumptions	Strong to acceptable financial ratios considering the level of project risk; robust project economic assumptions	Standard financial ratios considering the level of project risk	Aggressive financial ratios considering the level of project risk

No.	Criteria	Strong	Good	Satisfactory	Weak
c.	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
d.	*Financial structure* Duration of the credit compared to the duration of the project	Useful life of the project significantly exceeds tenor of the loan	Useful life of the project exceeds tenor of the loan	Useful life of the project exceeds tenor of the loan	Useful life of the project may not exceed tenor of the loan
e.	*Financial structure* Financing repayment / investment amortisation schedule	Amortising exposure	Amortising exposure	Amortising repayments with limited bullet payment	Bullet repayment or amortising repayments with high bullet repayment
2.	**Political and legal environment**				
a.	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

No.	Criteria	Strong	Good	Satisfactory	Weak
b.	Force majeure risk (war, civil unrest, etc.),	Low exposure	Acceptable exposure	Standard protection	Significant risks, not fully mitigated
c.	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
d.	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
e.	Acquisition of all necessary supports and approvals for such relief from local content laws	Strong	Satisfactory	Fair	Weak
f.	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

No.	Criteria	Strong	Good	Satisfactory	Weak
3.	**Transaction characteristics**				
a.	Design and technology risk	Fully proven technology and design	Fully proven technology and design	Proven technology and design – start-up issues are mitigated by a strong completion package	Unproven technology and design; technology issues exist and/or complex design
b.	*Construction risk* Permitting and siting	All permits have been obtained	Some permits are still outstanding but their receipt is considered very likely	Some permits are still outstanding but the permitting process is well defined and they are considered routine	Key permits still need to be obtained and are not considered routine. Significant conditions may be attached
c.	*Construction risk* 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
d.	Completion guarantees	Substantial liquidated damages supported by financial substance and/or strong completion guarantee from	Significant liquidated damages supported by financial substance and/or completion guarantee from	Adequate liquidated damages supported by financial substance and/or completion guarantee from sponsors with good	Inadequate liquidated damages or not supported by financial substance or weak completion guarantees

No.	Criteria	Strong	Good	Satisfactory	Weak
		sponsors with excellent financial standing	sponsors with good financial standing	financial standing	
e.	Track record and financial strength of contractor in constructing similar projects.	Strong	Good	Satisfactory	Weak
f.	*Operating risk* Scope and nature of operations and maintenance (O & M) contracts	Strong long-term O&M contract, preferably with contractual performance incentives, and/or O&M reserve accounts	Long-term O&M contract, and/or O&M reserve accounts	Limited O&M contract or O&M reserve account	No O&M contract: risk of high operational cost overruns beyond mitigants
g.	*Operating risk* 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
h.	*Off-take risk* If there is a take-or-pay or fixed-price off-take contract:	Excellent creditworthiness of offtaker; strong termination clauses; tenor of contract comfortably exceeds the maturity of the debt	Good creditworthiness of off-taker; strong termination clauses; tenor of contract exceeds the maturity of the debt	Acceptable financial standing of off-taker; normal termination clauses; tenor of contract generally matches the maturity of the debt	Weak off-taker; weak termination clauses; tenor of contract does not exceed the maturity of the debt

No.	Criteria	Strong	Good	Satisfactory	Weak
i.	*Off-take risk* 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
j.	*Supply risk* Price, volume and transportation risk of feed-stocks; supplier's track record and financial strength	Long-term supply contract with supplier of excellent financial standing	Long-term supply contract with supplier of good financial standing	Long-term supply contract with supplier of good financial standing – a degree of price risk may remain	Short-term supply contract or long-term supply contract with financially weak supplier – a degree of price risk definitely remains
k.	*Supply risk* Reserve risks (for example 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

No.	Criteria	Strong	Good	Satisfactory	Weak
4.	**Strength of Sponsor**				
a.	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
b.	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
5.	**Security Package**				
a.	Assignment of contracts and accounts	Fully comprehensive	Comprehensive	Satisfactory	Weak
b.	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
c.	Lender's control over cash flow (for example cash sweeps, independent escrow accounts)	Strong	Satisfactory	Fair	Weak

No.	Criteria	Strong	Good	Satisfactory	Weak
d.	Strength of the covenant package (mandatory prepayments, payment deferrals, payment cascade, dividend restrictions)	Covenant package is strong for this type of project. Project may issue no additional debt	Covenant package is satisfactory for this type of project. Project may issue extremely limited additional debt	Covenant package is fair for this type of project. Project may issue limited additional debt	Covenant package is Insufficient for this type of project. Project may issue unlimited additional debt
e.	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

Income-Producing Real Estate

No.	Criteria	Strong	Good	Satisfactory	Weak
1.	**Financial strength**				
a.	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	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	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	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

No.	Criteria	Strong	Good	Satisfactory	Weak
		or lower than forecasted demand	equal to forecasted demand	capabilities may not be state of the art compared to new projects	less favourable compared to those expiring
b.	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 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 loan-to-value 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 loan-to-value	The property's DSCR has deteriorated significantly and its loan-to-value is well above underwriting standards for new loans
c.	Stress analysis	The property's resources, contingencies and liability structure allow it to meet its financial obligations during a period of	The property can meet its financial obligations under a sustained period of financial stress (for example interest rates, economic	During an economic downturn, the property would suffer a decline in revenue that would limit its ability to fund	The property's financial condition is strained and is likely to default unless conditions improve in the near term

No.	Criteria	Strong	Good	Satisfactory	Weak
		severe financial stress (for example interest rates, economic growth)	growth). The property is likely to default only under severe economic conditions	capital expenditures and significantly increase the risk of default	
d.	*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
e.	*Cash-flow predictability* (b) For complete but not stabilised property	Leasing activity meets or exceeds projections. The project should	Leasing activity meets or exceeds projections. The project should	Most leasing activity is within projections; however,	Market rents do not meet expectations. Despite achieving target occupancy

No.	Criteria	Strong	Good	Satisfactory	Weak
		achieve stabilisation in the near future	achieve stabilisation in the near future	stabilisation will not occur for some time	rate, cash flow coverage is tight due to disappointing revenue
f.	*Cash-flow predictability* (c) For construction phase	The property is entirely pre-leased through the tenor of the loan or pre-sold to an investment grade tenant or buyer, or the banking institution has a binding commitment for take-out financing from an investment grade lender	The property is entirely pre-leased or pre-sold to a creditworthy tenant or buyer, or the banking institution 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 banking institution 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
2.	**Asset characteristics**				
a.	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

No.	Criteria	Strong	Good	Satisfactory	Weak
b.	Design and condition	Property is favoured due to its design, configuration, and maintenance, and is highly competitive with new properties	Property is appropriate in terms of its design, configuration and maintenance. The property's design and capabilities are competitive with new properties	Property is adequate in terms of its configuration, design and maintenance	Weaknesses exist in the property's configuration, design or maintenance
c.	Property is under construction	Construction budget is conservative and technical hazards are limited. Contractors are highly qualified	Construction budget is conservative and technical hazards are limited. Contractors are highly qualified	Construction budget is adequate and contractors are ordinarily qualified	Project is over budget or unrealistic given its technical hazards. Contractors may be under qualified
3.	**Strength of Sponsor/Developer**				
a.	Financial capacity and willingness to support the property.	The sponsor /developer made a substantial cash contribution to the construction or purchase of the property. The sponsor/developer has substantial resources and limited direct and	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	The sponsor /developer's contribution may be immaterial or non-cash. The sponsor/developer is average to below average in financial resources	The sponsor /developer lacks capacity or willingness to support the property

No.	Criteria	Strong	Good	Satisfactory	Weak
		contingent liabilities. The sponsor/developer's properties are diversified geographically and by property type	event of a cash flow shortfall. The sponsor/developer's properties are located in several geographic regions		
b.	Reputation and track record with similar properties.	Experienced management and high sponsors' quality. Strong reputation and lengthy and successful record with similar properties	Appropriate management and sponsors' quality. The sponsor or management has a successful record with similar properties	Moderate management and sponsors' quality. Management or sponsor track record does not raise serious concerns	Ineffective management and substandard sponsors' quality. Management and sponsor difficulties have contributed to difficulties in managing properties in the past
c.	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

No.	Criteria	Strong	Good	Satisfactory	Weak
4.	**Security Package**				
a.	Nature of lien	Perfected first lien	Perfected first lien	Perfected first lien	Ability of lender to foreclose is constrained
b.	Assignment of rents (for projects leased to long-term tenants)	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to remit rents directly to the lender, such as a current rent roll and copies of the project's leases	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender, such as current rent roll and copies of the project's leases	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender, such as current rent roll and copies of the project's leases	The lender has not obtained an assignment of the leases or has not maintained the information necessary to readily provide notice to the building's tenants
c.	Quality of the insurance coverage	Appropriate	Appropriate	Appropriate	Substandard

Object Finance Exposure

No.	Criteria	Strong	Good	Satisfactory	Weak
1.	**Financial strength**				
a.	Market conditions	Demand is strong and growing, strong entry barriers, low sensitivity to changes in technology and	Demand is strong and stable. Some entry barriers, some sensitivity to changes in technology and	Demand is adequate and stable, limited entry barriers, significant sensitivity to changes in technology and	Demand is weak and declining, vulnerable to changes in technology and economic outlook,

No.	Criteria	Strong	Good	Satisfactory	Weak
		economic outlook	economic outlook	economic outlook	highly uncertain environment
b.	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
c.	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
d.	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

No.	Criteria	Strong	Good	Satisfactory	Weak
2.	**Political and legal environment**				
a.	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
b.	Legal and regulatory risks	Jurisdiction is favourable to repossession and enforcement of contracts	Jurisdiction is favourable to repossession and enforcement of contracts	Jurisdiction is generally favourable to repossession and enforcement of contracts, even if repossession might be long and/or difficult	Poor or unstable legal and regulatory environment. Jurisdiction may make repossession and enforcement of contracts lengthy or impossible
3.	**Transaction characteristics**				
a.	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
4.	**Operating risk**				
a.	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	Problems in obtaining all required permits, part of the planned configuration and/or planned

No.	Criteria	Strong	Good	Satisfactory	Weak
				safety regulations	operations might need to be revised
b.	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
c.	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
5.	**Asset characteristics**				
a.	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

No.	Criteria	Strong	Good	Satisfactory	Weak
b.	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
c.	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
6.	**Strength of sponsor**				
a.	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
b.	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
7.	**Security Package**				
a.	Asset control	Legal documentation provides the lender effective control (for example a first perfected security interest, or a	Legal documentation provides the lender effective control (for example a perfected security interest, or a	Legal documentation provides the lender effective control (for example a perfected security interest, or a leasing structure including such	The contract provides little security to the lender and leaves room to some risk of losing control on the asset

No.	Criteria	Strong	Good	Satisfactory	Weak
		leasing structure including such security) on the asset, or on the company owning it	leasing structure including such security) on the asset, or on the company owning it	security) on the asset, or on the company owning it	
b.	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
c.	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

Commodities Finance Exposures

No.	Criteria	Strong	Good	Satisfactory	Weak
1.	**Financial strength**				
a.	Degree of over collateralisation of trade	Strong	Good	Satisfactory	Weak
2.	**Political and legal environment**				
a.	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)
b.	Mitigation of country risks	Very strong mitigation: Strong offshore mechanisms, strategic commodity 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
3.	**Asset characteristics**				
a.	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

No.	Criteria	Strong	Good	Satisfactory	Weak
4.	**Strength of Sponsor**				
a.	Financial strength of trader	Very strong, relative to trading philosophy and risks	Strong	Adequate	Weak
b.	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
c.	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
d.	Quality of financial disclosure	Excellent	Good	Satisfactory	Financial disclosure contains some uncertainties or is insufficient
5.	**Security Package**				
a.	Asset control	First perfected security interest provides the lender legal control of the	First perfected security interest provides the lender legal control of the	At some point in the process, there is a rupture in the control of the	Contract leaves room for some risk of losing control over the assets.

No.	Criteria	Strong	Good	Satisfactory	Weak
		assets at any time if needed	assets at any time if needed	assets by the lender. The rupture is mitigated by knowledge of the trade process or a third party undertaking as the case may be	Recovery could be jeopardised
b.	Insurance against damages	Strong insurance coverage including collateral damages with top quality insurance companies	Satisfactory insurance coverage (not including collateral damages) with good quality insurance companies	Fair insurance coverage (not including collateral damages) with acceptable quality insurance companies	Weak insurance coverage (not including collateral damages) or with weak quality insurance companies

Appendix VIII Counterparty Credit Risk and Current Exposure Method

Counterparty Credit Risk

1. 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.

2. The methods for computing the exposure amount under the standardised approach for credit risk or the EAD under the IRB approach to credit risk described in this appendix are applicable to over-the-counter (OTC) derivatives as well as to the securities financing transactions (SFTs). Such positions or transactions would generally exhibit the following characteristics:
   - Undertaken with an identified counterparty against which a unique probability of default can be determined.
   - Generate an exchange of payments or an exchange of a financial instrument (including commodities) against payment.
   - Generate a current exposure or market value.
   - Have an associated random future market value based on market variables.

3. Other common characteristics of these transactions may include the following:
   - 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.

- Positions are frequently valued (most commonly on a daily basis), according to market variables.
- Uses of credit risk mitigant such as collateralisation[276], netting and re-margining to mitigate risk.

4. An exposure value (or EAD) of zero for counterparty credit risk can be attributed to derivative contracts or SFTs that are outstanding with a central counterparty (for example 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. Furthermore, an exposure value (EAD) of zero can be attributed to banking institutions' credit risk exposures[277] to central counterparties that result from the derivative transactions, SFTs or spot transactions that the banking institution has outstanding with the central counterparty. Assets held by a central counterparty as a custodian on the banking institution's behalf would not be subject to a capital requirement for counterparty credit risk exposures.

5. 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 collateralised on a daily basis, thereby providing protection for the central counterparty's CCR exposures.

6. When a banking institution purchases credit derivative protection against a banking book exposure, or against a counterparty credit risk exposure, it

[276] Collateralisation may be inherent in the nature of some transactions.
[277] Example, from clearing deposits and collateral posted with the central counterparty.

will determine its capital requirement for the hedged exposure subject to the criteria and general rules for the recognition of credit derivatives as per the substitution rules in **Part B.3.4**. Where this rule applies, the exposure amount for counterparty credit risk from such transactions is zero.

7. The exposure amount for counterparty credit risk is zero for sold credit default swaps in the banking book where the exposures are treated in the guidelines as a guarantee provided by the banking institution and subject to a credit risk charge based on the full notional amount.

8. Under the current exposure method, the exposure amount for a given counterparty is equal to the sum of the exposure amounts calculated for each netting set[278] with that counterparty.

The Current Exposure Method

9. The current exposure method is to be applied to OTC derivative positions only, to determine the credit equivalent amount (or EAD) for these transactions for purposes of the capital adequacy calculation. SFTs (which include 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), shall be subject to the treatment set out under **Part B.2.5** and **Part B.3.4** of this framework;

10. For the OTC derivatives contracts, banking institutions are not exposed to credit risk for the full face value of the derivatives contracts, but only to the potential cost of replacing the cash-flow if the counterparty defaults. As such, the credit equivalent amount will depend, inter alia, on the maturity of

[278] A 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 paragraphs 19 to 24 of this appendix and **Part B.3.4**. Each transaction not subject to a legally enforceable bilateral netting arrangement that is recognised for regulatory capital purposes should be treated as its own netting set (separate from those whose bilateral netting arrangement is recognised for regulatory capital purposes).

the contract and on the volatility of the rates underlying that type of instrument.

11. Under the current exposure method, the computation of the credit equivalent exposure for derivatives contracts is based on the summation of the following two elements :-

- The replacement costs (obtained by marking-to-market) of all contracts with positive value (zero for contracts with negative replacement costs); and
- The amount of potential future exposure is calculated by multiplying the notional value of each contract by an "add-on" factor.

Credit exposure = positive MTM + (NP x "add-on" factor (%))

Where:

MTM	=	Mark-to-Market
NP	=	Notional principal
Add-on factor	=	As per **Appendix VIIIb**

(An illustration of the calculation under the current exposure method is given in **Appendix VIIIa**)

12. The "add-on" factors in computing the potential future exposure is determined based on the type of exposure and the residual maturity of each contracts. The "add-on" factors for derivatives contracts are listed in paragraphs 5.45 and 5.46 (for credit derivatives transactions), and **Appendix VIIIb**.

13. The credit equivalent amounts of exchange rate and interest rate contracts are to be risk-weighted according to the category of the counterparty, including the use of concessionary weightings in respect of exposures backed by eligible guarantees and collateral. Nevertheless, the Bank reserves the right to raise the risk weights if the average credit quality deteriorates or if loss experience increases.

14. Banking institutions can obtain capital relief for collateral eligible as defined under the comprehensive approach of this framework subject to the same operational requirements.

15. The calculation of the exposure for an individual contract for a collateralised OTC derivatives transaction[279] will be as follows:

Credit exposure= positive MTM + (NP x "add-on factor"(%))- C_A

Where:

MTM	=	Mark-to-Market
NP	=	Notional principal
Add-on factor	=	As per **Appendix VIIb**
C_A	=	Volatility-adjusted collateral amount under the comprehensive approach

16. When effective bilateral netting contracts are in place in a collateralised OTC derivative transaction, MTM will be the net replacement cost and the add-on will be A_{Net} as calculated above. The haircut for currency risk (H_{FX}) should be applied when there is a mismatch between the collateral currency and the settlement currency. Even in the case where there are more than two currencies involved in the exposure, collateral and settlement currency, a single haircut assuming a 10-business day holding period scaled up as necessary depending on the frequency of mark-to-market will be applied.

17. Counterparty credit risk exposure amount for single name credit derivative transactions in the trading book will be calculated using the potential future exposure "add-on" factors set out in the market risk component of this framework.

18. Where a credit derivative is an Nth to default transaction (such as a first to default transaction) the treatment specified in market risk component of this

[279] For example, collateralised interest rate swap transactions.

framework applies.

Bilateral Netting

19. Bilateral netting involves weighting of the net rather than the gross claims with the same counterparties arising out of the full range of forwards, swaps, options and similar derivative contracts. Careful consideration needs to be given to ensure that there is no reduction in counterparty risk, especially in cases if a liquidator of a failed counterparty has (or may have) the right to unbundle netted contracts, demanding performance on those contracts favourable to the failed counterparty and defaulting on unfavourable contracts.

20. Therefore, for capital adequacy purposes, bilateral netting[280] may be conducted only under the following circumstances:

- Banking institutions may net transactions subject to novation under which any obligation between a banking institution and its counterparty to deliver a given currency on a given value date is automatically amalgamated with all other obligations for the same currency and value date, legally substituting one single amount for the previous gross obligations; or
- Banking institutions may also net transactions subject to any legally valid form of bilateral netting not covered above, including other forms of novation.

21. In both cases above, a banking institution will need to satisfy the Bank that it has:

- A netting contract or agreement with the counterparty which creates a single legal obligation, covering all included transactions, such that the banking institution would have either a claim to receive or obligation to pay only the net sum of the positive and negative mark

[280] Payments netting, whish is designed to reduce the operational costs of daily settlements, will not be recognised in this framework since the counterparty's gross obligations are not in any way affected.

to market values of included individual transactions in the event a counterparty fails to perform due to any of the following: default, bankruptcy, liquidation or similar circumstances;

- Written and reasoned legal opinions that, in the event of a legal challenge, the relevant courts and administrative authorities would find the banking institution's exposure to be such a net amount under:

  a. 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;

  b. The law that governs the individual transactions; and

  c. The law that governs any contract or agreement necessary to effect the netting.

The Bank will have to be satisfied that the netting is enforceable under the laws of each of the relevant jurisdictions[281];

- Procedures in place to ensure that the legal characteristics of netting arrangements are kept under review in the light of possible changes in relevant law.

22. Contracts containing walkaway clauses will not be eligible for netting for the purpose of calculating capital requirements. A walkaway clause is a provision which permits a non defaulting counterparty to make only limited payments or no payment at all to the estate of a defaulter, even if the defaulter is a net creditor.

23. Credit exposure on bilaterally netted forward transactions will be calculated as the sum of the net mark to market replacement cost, if positive, plus an "add-on" based on the notional underlying principal. The "add-on" for netted transactions (A_{Net}) will equal the weighted average of the gross "add-on"

[281] If the Bank and other national supervisors are dissatisfied about the enforceability under the laws, the netting contract or agreement will not meet this condition and neither counterparty could obtain supervisory benefit.

(A_{Gross})[282] and the gross "add-on" adjusted by the ratio of net current replacement cost to gross current replacement cost (NGR). This is expressed through the following formula:

$$A_{Net} = 0.4*A_{Gross}+0.6*NGR*A_{Gross}$$

Where:

NGR = level of net replacement cost/level of gross replacement cost for transactions subject to legally enforceable netting agreements[283]

24. The scale of the gross "add-ons" to apply in this formula will be the same as those for non netted transactions as set out in paragraphs 9 to 18 of this appendix. The Bank will continue to review the scale of "add-ons" to make sure they are appropriate. For purposes of calculating potential future credit exposure to a netting counterparty for forward foreign exchange contracts and other similar contracts in which notional principal is equivalent to cash flows, notional principal is defined as the net receipts falling due on each value date in each currency. The reason for this is that offsetting contracts in the same currency maturing on the same date will have lower potential future exposure as well as lower current exposure.

[282] A_{Gross} equals the sum of individual add on amounts (calculated by multiplying the notional principal amount by the appropriate add on factors set out in paragraph 11 of this appendix) of all transactions subject to legally enforceable netting agreements with one counterparty.

[283] A_{Gross} equals the sum of individual add-on amounts (calculated by multiplying the notional principal amount by the appropriate add-on factors)

Appendix VIIIa Sample Computation of the Capital Requirement and Exposure at Default (EAD) for a Portfolio of Derivative Contracts

Transaction I

Type of instrument	:	8 Year Fixed-to-floating Cross Currency Interest Rate Swap (CCIRS)
Notional principal amount	:	RM1,000,000
Current date of report	:	31 December 1997
Maturity date	:	31 December 2000
Remaining maturity	:	3 years
Replacement cost	:	RM350,000 (+ve)

Transaction II

Type of instrument	:	6 Year Fixed-to-floating Interest Rate Swap (IRS)
Notional principal amount	:	RM1,000,000
Current date of report	:	31 December 1997
Maturity date	:	31 December 2002
Remaining maturity	:	5 years
Replacement cost	:	RM200,000 (-ve)

Type of instrument	CCIRS	IRS	Total
Credit equivalent exposure (exposure at default) = positive replacement cost + potential future exposure	350,000 + {1,000,000 x (2% + 7%)} =350,000 + 90,000 =440,000	0 + {1,000,000 x (4%)} = 0 + 40,000 = 40,000	480,000
Risk-weighted asset (assume risk weight of 50%)	440,000 x 50% = 220,000	40,000 x 50% = 20,000	240,000
Capital requirement (8%)	220,000 x 8% =17,600	20,000 x 8% =1,600	19,200

Appendix VIIIb "Add-on" Factors for Derivatives Contracts

Schedule 1

"Add-on" factors for derivative contracts with interest rate exposures

Residual maturity	Factor (%)
≤ 14 calendar days	Nil
> 14 calendar days and ≤ 6 months	0.10%
>6 months and ≤ 1 year	0.25%
> I year and ≤ 2 years	1.0%
> 2 year and ≤ years	2.0%
> 3 year and ≤ 4 years	3.0%
> 4 year and ≤ 5 years	4.0%
> 5 year and ≤ 6 years	5.0%
> 6 year and ≤ 7 years	6.0%
for each additional year	add 1.0%

Schedule 2

"Add-on" factors for derivative contracts with foreign exchange exposures

Residual maturity	Factor (%)
≤ 14 calendar days	Nil
> 14 calendar days and ≤ 6 months	1.5%
> 6 months and ≤ 1 year	3.0%
> I year and ≤ 2 years	5.0%
> 2 year and ≤3 years	7.0%
> 3 year and ≤ 4 years	8.0%
> 4 year and ≤ 5 years	9.0%
> 5 year and ≤6 years	10.0%
> 6 year and ≤ 10 years	11.0%
> 10 years	12.0%

Schedule 3

"Add-on" factors for other types of contracts

	Gold	Equities	Precious Metals Except Gold	Other Commodities
One year or less	1.0%	6.0%	7.0%	10.0%
Over one year to five years	5.0%	8.0%	7.0%	12.0%
Over five years	7.5%	10.0%	8.0%	15.0%

Notes: Forwards, swaps, purchased options and similar derivative contracts not covered by any of the columns of this matrix are to be treated as 'other commodities'

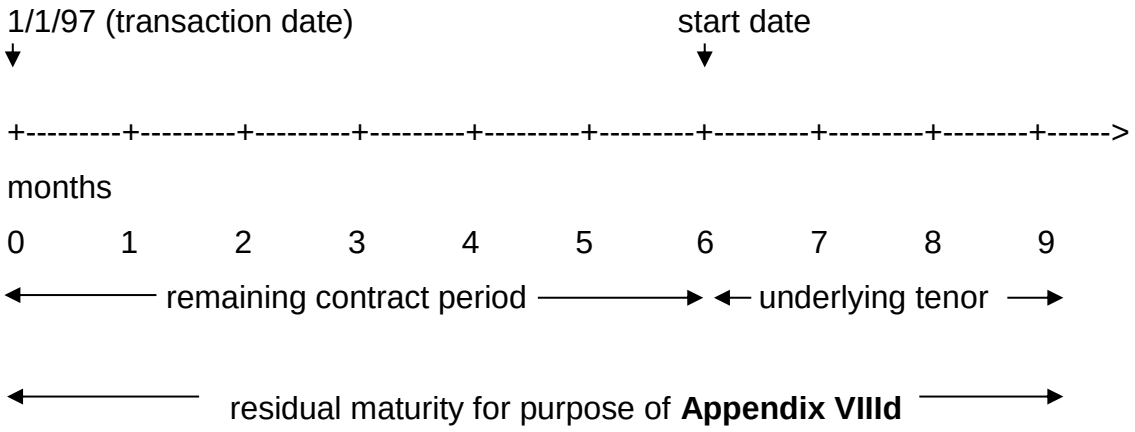
Additional notes "add-on" factors:

- For derivative contracts which are sensitive to movements in more than one type of rates, the "add-on" factors used will be the summation of the "add-on" factors for the various types of exposures according to the relevant residual maturity bucket;
- For contracts with multiple exchanges of principal, the notional principal amount is the sum of the remaining exchanges of principal. This shall represent the amount to be multiplied with the "add-on" factors;
- For both forward rate agreements and over-the-counter interest rate contracts of similar nature which are settled in cash on start date, residual maturity is measured as the sum of the remaining contract period and the underlying tenor of the contract (An illustration is provided in **Appendix VIIIc**). Institutions may choose to apply discounts to the "add-on" factors if the remaining contract period, as a fraction of residual maturity, falls within a certain range (please refer to **Appendix VIIId**) for the discount factor and range of residual maturity.
- For single currency floating-to-floating interest rate swaps, the "add-on" factor is zero. Thus, the credit exposure for such contracts will comprise only the positive mark-to-market value;
- For contracts that are structured to settle outstanding exposure following specified payment dates and where the terms are reset such that the market value of the contract is zero on these specified dates, the residual maturity would be set equal to the time until the next reset date. In the case of interest rate contracts with remaining maturities of more than one year that meet the above criteria, the "add-on" factor is subject to a floor of 0.5%.

- The “add-ons” should be based on effective rather than notional amounts. In the event that the stated notional amount is leveraged or enhanced by the structure of the transaction, banking institutions must use the effective notional amount when determining potential future exposure.

Appendix VIIIc Example for Calculation of Residual Maturity (for Forward Rate Agreements and Over-The-Counter Interest Rate Contracts of Similar Nature which are Settled in Cash on Start Date)

A 3-month forward rate agreement for delivery in June 1997



Appendix VIIId Discount Factor and Range of Residual Maturity

t = Remaining contract period / Residual maturity	**Discount to "Add-on" Factor**
t < 0.01	75%
0.01 ≤ t < 0.05	50%
0.05 ≤ t < 0.10	25%
0.10 ≤ t < 0.65	no discount
0.65 ≤ t < 0.80	25%
0.80 ≤ t < 0.90	50%
t ≥ 0.90	75%

Appendix IX Capital Treatment for Failed Trades and Non-DvP Transactions

1. The capital treatment specified in this appendix is applicable to all transactions[284] on securities, foreign exchange instruments and commodities that give rise to a risk of delayed settlement or delivery. This may include 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.

2. Transactions on securities, foreign exchange contracts or commodities may be settled via the following:
   - delivery-versus-payment system (DvP)[285], which provides simultaneous exchanges of securities for cash, hence exposing banking institutions 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); or
   - non-DvP or free-delivery system, whereby 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, hence exposing banking institutions to a risk of loss on the full amount of cash paid or deliverables delivered.

3. The Bank may use its discretion to waive capital charges in cases of a system wide failure of a settlement or clearing system, until the situation is rectified. Failure by a counterparty to settle a trade in itself will not be deemed a default for purposes of credit risk under this framework.

4. In applying the risk weight to failed free-delivery exposures, banking institutions using the IRB approach may assign PDs to counterparties for which they have no other banking book exposure on the basis of the

[284] All repurchase and reverse-repurchase agreements as well as securities lending and borrowing, including those that have failed to settle, are treated in accordance with the parts on credit risk mitigation of this framework.

[285] For the purpose of this framework, DvP transactions include payment-versus-payment (PvP) transactions.

counterparty's external rating. Banking institutions 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, banking institutions using the IRB approach may opt to apply the standardised approach risk weight or a 100% risk weight, subject to the exposures being immaterial.

Capital Requirements (for other than equities for Investment Banks)

5. For DvP transactions, if the payments have not yet taken place five business days after the settlement date, banking institutions must calculate a capital charge by multiplying the positive current exposure of the transaction by the appropriate corresponding risk multiplier. The corresponding risk multiplied and risk weights are given in the table below:

Number of working days after the agreed settlement date	Corresponding risk multiplier	Corresponding risk weight
From 5 to 15	8%	100%
From 16 to 30	50%	625%
From 31 to 45	75%	937.5%
46 or more	100%	1250%

6. Banking institutions are allowed a reasonable transition period to upgrade their information systems to track the number of days after the agreed settlement date and calculate the corresponding capital charge.

7. For non-DvP transactions (i.e. free deliveries), after the first contractual payment/delivery leg, banking institution 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[286]. Banking institutions shall use the standardised risk weights or the appropriate IRB formula, respectively set forth in this

[286] If the dates when two payment legs are made are the same according to the time zones where each payment is made, it is deemed that they are settled on the same day. For example, if a bank in Tokyo transfers Yen on day X (Japan Standard Time) and receives corresponding US Dollar via CHIPS on day X (US Eastern Standard Time), the settlement is deemed to take place on the same value date.

framework for the exposure to the counterparty, in the same way as it does for all other banking book exposures. However, when exposures are not material, banking institutions 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 banking institution that has made the first payment leg must apply a 1250% risk weight to the full amount of the value transferred plus replacement cost, if any. This treatment will apply until the second payment/delivery leg is effectively made.

Counterparty Risk Requirement for Investment Banks

8. The counterparty risk requirement (CRR) aims to measure the amount necessary to accommodate a given level of a counterparty risk[287] specifically for unsettled trades[288] and free deliveries with respect to an investment bank's equity business. The CRR capital charge (as given in the table below) will be multiplied by a factor of 12.5 to arrive at the CRR risk-weighted asset amount.

Agency Trade Transactions

	Time Period	CRR
Sales contract	Day, T to T+2	CRR = 0
	T+3 to T+30	CRR = 8% of market value (MV) of contract X Counterparty Risk weight, if current MV of contract > transaction value of contract CRR = 0, if current MV of contract <= transaction value of contract
	Beyond T+30	CRR = MV of contract X Counterparty Risk weight, if current MV of contract > transaction value of contract CRR = 0, if MV of contract <= transaction value of contract
Purchase contract	Day, T to T+3	CRR = 0

[287] Counterparty risk means the risk of a counterparty defaulting on its financial obligation to the banking institution.

[288] An unsettled agency purchase/sale or an unsettled principal sale/purchase.

Agency Trade Transactions

	Time Period	CRR
	T+4 to T+30	CRR = 8% of MV of contract X Counterparty Risk weight, if MV of contract < transaction value of contract CRR = 0, if MV of contract >= transaction value of contract
	Beyond T+30	CRR = MV of contract X Counterparty Risk weight, if MV of contract < transaction value of contract CRR = 0, if MV of contract >= transaction value of contract

Principal Trade Transactions

	Time Period	CRR
Sales contract	Day, T to T+3	CRR = 0
	T+4 to T+30	CRR = 8% of MV of contract X Counterparty Risk weight, if MV of contract < transaction value of contract CRR = 0, if MV of contract >= transaction value of contract
	Beyond T+30	CRR = MV of contract X Counterparty Risk weight, if MV of contract < transaction value of contract CRR = 0, if MV of contract >= transaction value of contract
Purchase contract	Day, T to T+3	CRR = 0
	T+4 to T+30	CRR = 8% of MV of contract X Counterparty Risk weight, if MV of contract > transaction value of contract CRR = 0, if MV of contract <= transaction value of contract
	Beyond T+30	CRR = MV of contract X Counterparty Risk weight, if MV of contract > transaction value of contract CRR = 0, if MV of contract <= transaction value of contract

Free Deliveries[289]

	Time Period	CRR
	Day, D[290] to D+1	CRR = 8% of Transaction value of contract X Counterparty Risk weight
	Beyond D+1	CRR = Transaction value of contract

[289] Where an investment bank delivers equities without receiving payment, or pays for equities without receiving the equities.

[290] Due date where the investment bank delivers equities without receiving payment shall be the date of such delivery, and where the investment bank pays for equities without receiving the equities, shall be the date of such payment.

Appendix X List of Recognised Exchanges*

1. American Stock Exchange (USA)
2. Athens Stock Exchange (Greece)
3. Australian Stock Exchange (Australia)
4. Bermuda Stock Exchange (Bermuda)
5. BME Spanish Exchanges (Spain)
6. Bolsa de Comercio de Buenos Aires (Argentina)
7. Bolsa de Comercio de Santiago (Chile)
8. Bolsa de Valores de Colombia (Colombia)
9. Bolsa de Valores de Lima (Peru)
10. Bolsa de Valores do Sao Paulo (Brazil)
11. Bolsa Mexicana de Valores (Mexico)
12. Bolsa Italiana SPA (Italy)
13. Bourse de Luxembourg (Luxembourg)
14. Bourse de Montreal (Canada)
15. BSE The Stock Exchange, Mumbai (India)
16. Budapest Stock Exchange Ltd (Hungary)
17. Bursa Malaysia Bhd (Malaysia)
18. Chicago Board Options Exchange (USA)
19. Colombo Stock Exchange (Sri Lanka)
20. Copenhagen Stock Exchange (Denmark)
21. Deutsche Borse AG (Germany)
22. Euronext Amsterdam (Netherlands)
23. Euronext Brussels (Belgium)
24. Euronext Lisbon (Portugal)
25. Euronext Paris (France)
26. Hong Kong Exchanges and Clearing (Hong Kong)
27. Irish Stock Exchange (Ireland)
28. Istanbul Stock Exchange (Turkey)
29. Jakarta Stock Exchange (Indonesia)
30. JSE Ltd. (South Africa)
31. Korea Exchange (South Korea)
32. Ljubljana Stock Exchange (Slovenia)
33. London Stock Exchange (United Kingdom)
34. Malta Stock Exchange (Malta)
35. NASD (USA)
36. National Stock Exchange of India Limited (India)
37. New York Stock Exchange (USA)
38. New Zealand Stock Exchange Ltd (New Zealand)
39. OMX Exchanges Ltd (Finland & Sweden)
40. Osaka Securities Exchange (Japan)
41. Oslo Bors (Norway)
42. Philippine Stock Exchange (Philippines)
43. Shanghai Stock Exchange (China)
44. Shenzhen Stock Exchange (China)
45. Singapore Exchange (Singapore)
46. Stock Exchange of Tehran (Iran)

47. Stock Exchange of Thailand (Thailand)
48. SWX Swiss Exchange (Switzerland)
49. Taiwan Stock Exchange Corp (Taiwan)
50. Tokyo Stock Exchange (Japan)
51. TSX Group (Canada)
52. Warsaw Stock Exchange (Poland)
53. Wiener Bourse (Austria)

* To be updated as and when changes occur.

Appendix XI Recognition Criteria for Physical Collateral Used For Credit Risk Mitigation Purposes of Islamic Banking Exposures

General Criteria

1. Banking institutions are allowed to recognise physical assets as eligible collateral for credit risk mitigation purposes for Islamic banking exposures, subject to fulfilling all the minimum requirements specified in this framework and obtaining prior approval from the Board. In addition, banking institutions are required to notify the Bank two months in advance of any recognition.

2. Any physical assets must be completed for their intended use and must fulfil the following minimum conditions for recognition as eligible collateral:

   - The assets are legally owned by the banking institution. For *Ijarah* contracts, these are restricted to operating *Ijarah* only, where related costs of asset ownership are borne by the banking institution[291]; or
   - The physical assets attract capital charges other than credit risk prior to/ and throughout the financing period (e.g. operating *Ijarah* and inventories[292] under *Murabahah).*

Specific Criteria

Commercial real estate (CRE) and residential real estate (RRE)

3. Eligible CRE or RRE collateral are defined as:

   - Collateral where risk of the borrower is not materially dependent upon the performance of the underlying property or project, but rather on the underlying capacity of the borrower to repay the debt from other sources. As such, repayment of the facility is not materially dependent

[291] Shariah requires that the lessor/ owner bears the costs related to the ownership of or any other costs as agreed between the lessor and the lessee.

[292] This excludes inventories which are merely used as a 'pass-through' mechanism such as in Commodity *Murabahah* transactions.

on any cash flow generated by the underlying CRE/RRE serving as collateral; and

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

4. Subject to meeting the definition above, CRE and RRE will be eligible for recognition as credit risk mitigation under the comprehensive approach only if all of the following operational requirements are met:

(i) **Legal enforceability***:* any claim on collateral taken must be legally enforceable in all relevant jurisdictions, and any claim on collateral must be properly filed on a timely basis. Collateral interests must reflect a perfected lien (i.e. all legal requirements for establishing the claim has been fulfilled). Furthermore, the collateral agreement and the legal process underpinning it must be such that they provide for the reporting institution to realise the value of the collateral within a reasonable timeframe;

(ii) **Objective market value of collateral***:* the collateral must be valued at or less than the current fair value under which the property could be sold under private contract between a willing seller and an arm's-length buyer on the date of valuation;

(iii) **Frequent revaluation***:* a banking institution is expected to monitor the value of the collateral on a frequent basis and at a minimum once every year. More frequent monitoring is suggested where the market is subject to significant changes in conditions. Acceptable statistical methods of evaluation (for example reference to house price indices, sampling) may be used to update estimates or to identify collateral that may have declined in value and that may need re-appraisal. A qualified professional must evaluate the property when information indicates that

the value of the collateral may have declined materially relative to general market prices or when a credit event, such as default, occurs;

(iv) **Junior liens***:* Junior liens or junior legal charges may be taken into account where there is no doubt that the claim for collateral is legally enforceable and constitutes an efficient credit risk mitigant. Banking institutions could only use the residual value after taking into account collateral haircut. In this case, residual value is derived after deducting exposures with other pledgees, using approved limits or total outstanding amount of the exposures with other pledgees whichever is higher; and

(v) Banking institutions are also expected to meet the following collateral management requirements:

a. The types of CRE and RRE collateral accepted by the banking institution and lending policies when this type of collateral is taken must be clearly documented;

b. The banking institution must take steps to ensure that the property taken as collateral is adequately insured against damage or deterioration;

c. The banking institution must monitor on an ongoing basis the extent of any permissible prior claims (for example tax) on the property; and

(vi) The banking institution must appropriately monitor the risk of environmental liability arising in respect of the collateral, such as the presence of toxic material on a property.

Other physical assets[293]

5. Physical collateral other than CRE and RRE may be recognised as eligible collateral under the comprehensive approach if the following standards are met:

[293] Physical collateral in this context is defined as non-financial instruments collateral.

(i) Existence of liquid markets for disposal of collateral in an expeditious and economically efficient manner; and

(ii) Existence of well established, publicly available market prices for the collateral. The amount a banking institution receives when collateral is realised should not deviate significantly from these market prices.

6. Subject to meeting the above definition standards, other physical assets will be recognised as credit risk mitigation under the comprehensive approach only if it meets the operational requirements set out for CRE/RRE as well as the following criteria:

(i) ***First claim****:* only banking institutions having the first liens on, or charges over, collateral are permitted to recognise this type of collateral as credit risk mitigation. In this regard, the banking institution must have priority over all other lenders to the realised proceeds of the collateral;

(ii) The loan agreement must include detailed descriptions of the collateral plus detailed specifications of the manner and frequency of revaluation;

(iii) The types of physical collateral accepted by the banking institution and policies and practices in respect of the appropriate amount of each type of collateral relative to the exposure amount must be clearly documented in internal credit policies and procedures and available for examination and/or audit review;

(iv) Banking institution's credit policies with regard to the transaction structure must address appropriate collateral requirements relative to the exposure amount, the ability to liquidate the collateral readily, the ability to establish objectively a price or market value, the frequency with which the value can readily be obtained (including a professional appraisal or valuation), and the volatility of the value of the collateral. The periodic revaluation process must pay particular attention to "fashion-sensitive" collateral to ensure that valuations are appropriately adjusted downward for fashion, or model-year, obsolescence as well as physical obsolescence or deterioration; and

(v) In cases of inventories (for example raw materials, finished goods, dealers' inventories of autos) and equipment, the periodic revaluation process must include physical inspection of the collateral.

Leased assets

7. Assets used in operating *Ijārah* and *Ijārah* Muntahia Bittamleek (IMB) (leased assets) may be recognised as eligible collateral and used as credit risk mitigation under the comprehensive approach for collateralised transactions.

8. The leased assets must fulfill a function similar to that of collateral, and recognition of leased assets would be subject to reporting institutions fulfilling all minimum requirements under CRE/RRE or other physical collateral, depending on the type of leased assets, as well as the following additional standards:

(i) Robust risk management on the part of the banking institutions acting as the lessors with respect to the location of the asset, the use to which it is put, its age, and planned obsolescence;

(ii) A robust legal framework establishing the lessor's legal ownership of the asset and its ability to exercise its rights as owner in a timely manner; and

(iii) The difference between the rate of depreciation of the physical asset and the rate of amortisation of the lease payments must not be so large as to overstate the credit risk mitigation attributed to the leased assets.

Other Additional Criteria

Data maintenance

9. Banking institutions are expected to collect and retain the relevant data pertaining to revaluation and disposal of physical assets as a means to recover from delinquent or defaulted exposures, particularly data on disposal (i.e., selling) amount and timeline of disposal of the physical assets as well as the relevant costs incurred for the disposal.

10. Banking institutions are expected to use the relevant data to verify the appropriateness of the minimum 30% haircut on physical assets particularly non-CRE and non-RRE collateral at least on an annual basis. Banking institutions should use a more stringent haircut if their internal historical data on disposal of these physical assets reveal loss amounts that exceed the 30% haircut.

11. In addition, for the regulatory retail portfolio, banking institutions are required to have at least two years of empirical evidence on data such as recovery rates and value of physical collateral prior to its recognition as a credit risk mitigant.

Independent review

12. Banking institutions are required to conduct an independent review[294] to ascertain compliance with all minimum requirements specified in this framework for the purpose of recognising physical collateral as a credit risk mitigant. The review should be performed prior to the recognition of the physical collateral as a credit risk mitigant and at least annually thereafter to ensure on-going fulfilment of all criteria and operational requirements.

[294] Validation must be performed by a unit that is independent from risk taking/ business units.

Appendix XII Summary Table of Gross Income Computation

Conventional Banking and Islamic Banking Operations

Net Interest Income	**A**
Comprising:	
All Interest income	XXX
Excluding interest suspended and recoveries	
Less: Interest expense	(x)
Net[295] Non-Interest Income	**B**
Comprising:	
Net commissions/fees receivable	XX
Including outsourcing fees receivable, excluding outsourcing fees paid	XX
Net income from trading book securities:	
Including unrealised gains/losses from fair value changes of trading book securities	XX
Other operating income	X
Including intra-group income	X
Dividend income from investment in securities	X
Others	
Excluding:	
Dividend income from subsidiaries and associated companies	
Realised or unrealised profits/losses from sales or impairment of securities in banking book	
Income from extra-ordinary or irregular item	
Income from insurance recoveries	
Total Gross Income from Islamic Banking Operations	**C**
Total Gross Income	**A + B + C**

[295] Net only from any direct expenses associated with the income generated/received.

Islamic Banking Operations

Net income from financing activities	A
Net income from investment activities	B
Other income: Realised/unrealised gains/losses from sales or fair value changes of trading book securities Net commission/fees receivables Intra-group income Dividend income from investment in securities Income from non-*Sharī`ah* compliant sources Others <u>Excluding:</u> Dividend income from subsidiaries and associated companies Realised or unrealised profits/losses from sales or impairment of securities in banking book Income from extra-ordinary or irregular item Income from insurance recoveries Bad debt recovered	C
Less: Income attributable to investment account holders and other depositors	D
Total Gross Income	**A + B + C - D**

Appendix XIII Mapping of Business Lines

Level 1	Level 2	Activity Groups
Corporate Finance	Corporate Finance	Mergers and acquisitions, underwriting, privatisations, securitisation, research, debt (government, high yield), equity, syndications, IPO, secondary private placements
	Municipal/Government Finance	
	Merchant Banking	
	Advisory Services	
Trading & Sales	Sales	Fixed income, equity, foreign exchanges, commodities, credit, funding, own position securities, lending and repos, brokerage, debt, prime brokerage
	Market Making	
	Proprietary Positions	
	Treasury	
Retail Banking	Retail Banking	Retail lending and deposits, banking services, trust and estates
	Private Banking	Private lending and deposits, banking services, trust and estates, investment
	Card Services	Merchant/commercial/corporate cards, private labels and retail
Commercial Banking	Commercial Banking	Project finance, real estate, export finance, trade finance, factoring, leasing, lending, guarantees, bills of exchange
Payment and Settlement	External Clients	Payments and collections, funds transfer, clearing and settlement
Agency Services	Custody	Escrow, depository receipts, securities lending (customers)
	Corporate 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

Appendix XIV Illustration of the Offsetting Rules Between Negative and Positive OR Capital Charge in Any Business Lines

Business Line	Beta (β) %	Gross Income				Gross Income x β				OR Capital Charge
		March 08	Dec 07	Sept 07	June 07	March 08	Dec 07	Sept 07	June 07	Year 3
Corporate Finance	**18**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Trading and Sales	**18**	-9.00	5.00	-12.00	9.00	**-1.62**	0.90	**-2.16**	1.62	
Retail Banking	**12**	5.00	6.00	5.00	5.00	0.60	0.72	0.60	0.60	
Commercial Banking	**15**	10.00	5.00	-8.00	7.00	1.50	0.75	**-1.20**	1.05	
Payment and Settlement	**18**	2.00	2.00	1.00	2.00	0.36	0.36	0.18	0.36	
Agency Services	**15**	2.00	2.00	2.00	3.00	0.30	0.30	0.30	0.45	
Asset Management	**12**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Retail Brokerage	**12**	0.00	0.00	2.00	4.00	0.00	0.00	0.24	0.48	
Total		**10.00**	**20.00**	**-10.00**	**30.00**	**1.14**	**3.03**	**-2.04**	**4.56**	**6.69**

A similar manner of computation is required for the calculation of the annual gross income for the two years proceeding the most recent year. The aggregate operational risk capital charge is equivalent to the three year average of the simple summation of the regulatory capital charges.

Appendix XV Illustration of Computation of Exposures with Credit Risk Mitigation Effects

Example 1

Loan of RM1,000 with 5 years residual maturity to a BBB-rated corporate. The full amount of the loan is fully guaranteed by a corporate with an external rating (RAM) of AAA.

Solution (Simple approach)

Obligor's risk weight (RW)	Guarantor's RW
100%	20%

Using RW of the substitution, the RWA:

RWA = 1000 × 20%

= RM200

Example 2

Loan of RM1,000 to BBB-rated corporate. Half of the amount of the loan is secured by a AAA-rated MGS.

Solution (Comprehensive approach)

Variables	Supervisory haircut
He	No haircut applied as exposure is in the form of cash
Hc	0.02[296]
Hfx	No currency mismatch

Adjusted exposure (E*) = Max {0, [E × (1 + He) – C × (1 – Hc - Hfx)]}

= [1000 × (1 + 0) – 500 × (1 – 0.02 – 0)]

= RM510

Risk-weighted assets (RWA)[297] = RM510 × 100%

= **RM510**

[296] Refer to paragraph 2.119 standard supervisory haircuts table

[297] Refer to **Appendix III** on risk weight table for corporate exposure.

Example 3

Loan of RM1,000 to a small business with a residual maturity of 5 years. The loan is secured by receivables (the ratio of collateral value to nominal exposure is 125%).

Solution

No recognition for receivables as risk mitigation under the standardisation approach. Thus, the appropriate RW to be applied is 75%, regulatory retail (loan to small business)

RWA = RM1,000 × 75%

= **RM750**

Example 4

Loan of RM1,000 to a B-rated corporate with a 3-year residual maturity. Half of the exposure, RM500, is guaranteed by an A-rated bank.

Solution

RWA = (Exposure covered by guarantee, G_A) + (exposure not covered)

= (500 × 50%[298]) + [(1000 – 500) × 125%]

= 250 + 625

= **RM875**

Example 5

Bank A repos out cash of RM1,000 to a corporate with an external rating of AA. The corporate provides collateral in the form of debt securities issued by a bank with an external rating of AA. The debt securities have a remaining maturity of 7 years and a market value of RM990.

Variables	Supervisory haircuts	Scaling factor	Adjusted haircuts
He	Exposure in the form of cash, supervisory haircut = 0	0	Not applicable
Hc	0.08	$= \sqrt{[NR + (TM\ 1)]/10}$ $= \sqrt{[1^{72} + (5^{73} - 1)]/10}$ = 0.71	= 0.08[300] × 0.71 = 0.06
Hfx	No currency	0	Not applicable

[298] Refer to **Appendix III** on risk weight table for bank exposures.

[299] 5 business days holding period for repo style transaction, refer paragraph 2.122.

[300] Refer to paragraph 2.119 for standard supervisory haircuts table.

Variables	Supervisory haircuts	Scaling factor	Adjusted haircuts
	mismatch		

Solution

E* = max {0, [E × (1 + He) – C × (1 – Hc - Hfx)]}

= [1000 × (1+0) – 990 × (1 – 0.06 – 0)]

= 1000 – 930.6

= **RM69.40**

RWA = E* × RW

= 69.40 × 0.5

= **RM34.70**

Example 6

Bank A repos out RM1000 to Bank B (AA rated). It receives as collateral, 7-year BBB rated corporate bonds denominated in foreign currency with a value of RM800.

	Supervisory haircut	Scaling factor	Adjusted haircut
He	Exposure in the form of cash, haircut = 0.	Not applicable	
Hc	0.06	$= \sqrt{[NR + (TM - 1)]/10}$ $= \sqrt{1^{75} + (5^{76} - 1)]/10}$ = 0.71	= 0.06 × 0.71 = 0.04
Hfx	0.08	$= \sqrt{[1^{77} + (5^{78} 1)]/10}$ = 0.71	= 0.08 × 0.71 = 0.06

Solution

E* = E* = max {0, [E × (1 + He) – C × (1 – Hc - Hfx)]}

= [1000 × (1+0) – 800 × (1 - 0.04 – 0.06)]

= 1000 – 720

E* = **RM280**

RWA = E* × RW

= 280 × 0.5

= **RM140**

[301] 5 business days holding period for repo style transaction, refer paragraph 2.122.
[302] 5 business days holding period for repo style transaction, refer paragraph 2.122.

Example 7

Bank X lends cash of RM1000 to Bank Z (A rated) for a period of 5 years. Bank Z places a 2 year deposit of RM800 in Bank X.

Solution

Step 1. Calculate value of credit protection adjusted for maturity mismatch

Ca = C × (1 – Hc – Hfx) × (t – 0.25) / (T – 0.25)

= 800 × (1 – 0 - 0) × (2 – 0.25) / (5 – 0.25)

= 800 × 0.37

= **RM296**

Step 2. Calculate adjusted exposure

E* = max {0, [E × (1 + He) – Ca]}

= 1000 × (1 + 0) – 296

= **RM704**

RWA = E* × RWA

= 704 × 50%[303]

= **RM352**

[303] Refer to **Appendix III** on risk weight table for bank exposures.

Example 8: Proportional Cover

Loan to a BBB corporate of RM1,000 with a 3 year residual maturity. A guarantee of RM500 from a bank (A rated) with a remaining maturity of 3 years serves as collateral. The secured and unsecured portions are equal in seniority.

Solution

RWA = (GA X RW guarantor) + [(E – GA) X RW obligor]

= (500 x 50%) + [(1000 – 500) x 100%]

= 250 + 500

= **RM750**

Example 9: Treatment of Pools of Credit Risk Mitigation Techniques

Loan to a BBB corporate of RM1,000 with a 3 year residual maturity. The loan is secured by Guarantee of RM1,000 from a bank (A rated). Half of the guarantee has residual maturity of 3 years and the other half, a residual maturity of 2 years. In addition, the loan is also secured by an AAA rated MGS of RM500 with a residual maturity of 3 years. The bank opts to obtain the largest capital relief possible from the various risk mitigants.

Solution

RWA = (GA X RW MGS) + [(E – GA) X RW guarantor]

= (500 x 0%) + [(1000 – 500) x 50%]

= RM250

Appendix XVI Information Requirements for Application to Adopt the Internal Ratings Based Approach for Credit Risk

Banking institutions intending to adopt the IRB approach are required to submit the relevant information[304] in the following table:

1. Overall Implementation				
i)	Objective, goal and rationale for applying for IRB status	*Articulate the objectives, goals and rationale as approved by the board.*		
ii)	Governance structure of the implementation project	*Insert name, designation and responsibilities. Append chart if available.* *Explain the role of external parties, if applicable.*		
iii)	Scope and timeline of the rollout of IRB			
	• across asset class[305]	*Insert class name*	*Insert commencement date[306]*	*Insert completion date[307]*
	• across entity	*Insert entity name*	*Insert commencement date*	*Insert completion date*
	• exposures falling under temporary and permanent exemption, if any (as defined in paragraphs 3.4 to 3.6 and 3.14) and the plan to migrate the temporary portfolio to IRB.	*Insert class name*	*Insert commencement date*	*Insert completion date*
iv)	Detailed timeline (describe for each model to be adopted for each asset class and entity. For example, behavioural model for QRRE class in ABC entity)	*Insert work step (e.g. data collection, IT implementation)*	*Insert commencement date*	*Insert completion date*
v)	Detailed approved budget and committed resources for implementation	*Insert overall amount committed, estimate of personnel involved (breakdown where external parties are involved),*		

304 Information required is applicable to both internal and external models.
305 Include those already covered and to be covered in the future.
306 Date of commencement of 1st deliverable.
307 Date of completion of final deliverable.

vi) Cost-Benefits Analysis	*Provide a detailed estimate of cost in completing the entire IRB implementation project and explain the benefits gained from IRB adoption as compared to SA.*
2. Gap Analysis/ Validation/ Self-Assessment	
vii) Overview of gap analysis/ validation/ self-assessment process	*Explain the process and personnel involved in conducting the assessment, clarifying the skills and independence of the reviewer, where applicable. Explain the baseline/ benchmark used (BCBS guideline, or the Bank's guidelines).*
viii) Outcome of assessment	*List all gaps identified. Evaluate the impact of the gaps or non-compliances to the overall implementation of IRB.*
ix) Detailed plan for achieving compliance	*For each gap, explain the remedial actions taken, the time needed to bridge the gap and the person responsible. Alternatively, submit the detailed action plan.*
3. Information with regard to the IRB systems (append one for each rating system): ***Banking institutions should submit information (in the form of policies, reports and technical documentation) that describes its compliance with the relevant paragraphs on the IRB minimum requirements in this framework. The remarks that follow in this section are meant only as a guide.***	
x) Overview or general description of internal rating systems	*Describe the rating system in terms of the rating/ modeling approach, the time horizon and the segment of the portfolio, asset class or product type for which the rating system will be used.*
xi) Rating system design	*Elaborate on the existence of borrower and facility dimensions for each major portfolio. Explain the structural design of the rating system. Append any rating criteria, definition and assignment process adopted.*
xii) Rating system operations	*Describe how the rating assignment process ensures appropriate and consistent rating coverage. Elaborate on the controls put in place to ensure integrity of the process, including the process of reviewing and overriding ratings and loss estimates. Explain the process put in place to verify and assess data input for rating assignment. Explain (append if possible) the structure or framework for data maintenance and documentation.*
xiii) Rating system estimation (covering development and calibration)	*Explain the conceptual and technical features of the process undertaken to estimate the relevant parameters (PD, LGD, EAD etc.), inclusive of reasons (appropriateness, strength and weaknesses) and further enhancements to be taken. Explain and justify the differences, if any, in the definition of default adopted.* *Provide empirical analysis to justify the appropriateness of using the conventional IRB model and its parameters on the Islamic banking assets* *Describe the stress testing processes in place (including the scenarios adopted and the sources of information) in relation to capital adequacy.*

xiv) Rating system validation	*Include the measurement of performance especially on accuracy, calibration, stability and consistency.* *For banking institutions with an Islamic asset portfolio which leverages on a same model as their conventional assets, banking institutions are expected to assess the performance of the model specifically on the Islamic asset portfolio as well.*
xv) Overview of the internal governance structure of the rating system	*Append chart if available.*
• role of board (and its committees)	*Insert name and responsibilities specific to the governance of rating system (if any).*
• role of senior management (and its committees)	*Insert name and responsibilities specific to the governance of rating system as well as other critical responsibilities.*
• role of credit risk management unit (or its equivalent)	*Insert name and responsibilities specific to the design, selection, implementation and performance of rating system.*
• role of internal audit (or other relevant assurance function)	*Insert name and responsibilities specific to the review of rating system.*
xvi) Use of ratings	*Explain how the ratings will support internal business decisions. Explain any adjustments made if ratings are not used directly.*
xvii) Logical data model and the surrounding IT infrastructure	*Append the logical data fields used and their dependencies.*
xviii) Data extraction and cleansing processes	*Explain and attach the tests undertaken to verify the integrity of data.*
xix) IRB training conducted to relevant officers, senior management personnel and board members.	*List all relevant training (especially on the operations and use of ratings) conducted in the immediate past. Include areas covered, instructor's name, departments affected and date conducted. If possible, include training plans for the future.*

Appendix XVII Information Requirements for Application to Adopt the Internal Models Approach for Market Risk

Banking institutions intending to adopt the internal models approach for the computation of the market risk capital charge in the trading book are required to submit to Bank Negara Malaysia the following information:

A. General Information

Organisational Structure

1. The latest organisational chart showing the names and reporting lines of key personnel in charge of the front office, middle office, back office, finance and risk management functions.

2. Terms of reference or description of function for the following:
   a. Treasury Department
   b. Middle Office
   c. Back Office/Processing Unit
   d. Finance / Account Department
   e. Market Risk Management Unit

3. Terms of reference of Board Risk Management Committee and Market Risk Management Committee. Among others should include:
   a. role and composition of committees
   b. frequency of meetings
   c. information received

4. Information pack and minutes of the committees' meetings (described in 3 above) for the past 12 months including:
   a. discussion reports
   b. recommendations to the committee
   c. communication of decision

5. Background, experience and qualification of key treasury front office and market risk management personnel.
6. Number of staff in treasury front office and market risk management and their responsibilities.

Policies and Operational Manuals

7. Please provide the following policies and procedures (if maintained separately from documents required in 2 above:
    a. Treasury Front Office
    b. Trading and Investment
    c. Middle Office
    d. Back Office/Processing Unit
    e. Finance/Account Department
    f. Trading Book Policy Statement

Treasury Portfolio Data and Profit and Loss

8. List of treasury products and activities (please also specify products and activities that will be included in risk models).

9. Monthly detailed outstanding treasury transactions for the last 12 months.

10. Monthly detailed Treasury P&L for the last 12 months.

Internal Controls (with regards to treasury and market risk management)

11. Validation policy and programme.

12. Latest independent review reports.

13. Recent internal and external (if any) audits' reports.

14. Exception reports for the last 12 months.

Front office and Market Risk Management Information System (MIS) infrastructure

15. Structure of source systems (position capture) and risk measurement system.

16. System manuals.

17. Control structure surrounding risk measurement system.

B. Valuation Model Information (by risk categories)

18. Description of portfolio valuation model specifying whether model was purchased or developed in house. Description among others should include:
    a. mark-to-market/model methodology for all products
    b. cash flow mapping process
    c. detail products decomposition

19. For a purchased valuation model, description of adjustments made on the model.

20. Procedures on zero yield curve generation. Among others should include*:*
    a. source of rates
    b. interpolation methodology

21. Description of valuation adjustments made to cater for illiquidity, concentration etc.

C. Value-at-Risk (VaR) Measurement Information

Risk system

22. The scope of application for which approval is requested.

23. Description of units, portfolio or entity not covered by the model and reason(s) for exclusion.

24. Future developments and implementation schedule to incorporate any areas excluded from the scope of the model.

25. Future developments and implementation schedule of any planned changes or any future plans that have a bearing on the model.

26. Description and the flow chart of the individual risk supporting systems.

27. Description and the flow chart of the main risk measurement systems/engine.

Measurement methodology by risk categories (interest rate, equity, foreign exchange and commodities risks)

28. Overall description of VaR measurement approach (variance/covariance, Monte Carlo simulation, historical simulation). This should among others, includes:
    a. confidence interval used;
    b. holding period;
    c. description of historical data used to calculate volatility and correlation parameters and any weighting methodology used in the calculation specifying the “effective” observation period;
    d. any scaling factors used

29. Description of the underlying assumptions.

30. Description of historical data update process and frequency.

31. Description of underlying parameters. Among others, include:
    a. number of yield curves by currency
    b. number of risk factors by currency
    c. equity risk factors
    d. commodity risk factors

32. Description of how the models capture:
    a. non-linear effects particularly, options products;
    b. correlations within and across broad risk categories;
    c. specific risk, if any.

33. Time taken to generate VaR numbers and availability of VaR for distribution particularly to front office.

Stress testing

34. Description of the methodology used.

35. Stress test results for the past 12 months.

36. Stress test limits.

Back testing

37. Description of the methodology used.

38. Back testing results for the past 12 months.

D. Risk Appetite and Limit Structure

39. Overall limits structure imposed on trading book risk taking activities (VaR limits, notional limits etc.).

40. Policy and procedures governing limits allocation process.

41. Policy and procedures on discretionary powers (e.g. granting exception, temporary excesses etc.).

42. Escalation policy on exceptions.

E. Risk Management & Control

43. Please provide the policies and procedures for market risk management function.

44. List/summary of reports prepared by risk management on a daily basis. Description of timeline these reports available for senior management.

45. Description of future developments of risk measurement methodology, products and activities related to market risk.

Appendix XVIII Illustration of Computation of Large Exposure Risk Requirement

Scenario A

A banking institution holds exposures consisting of shares and in-the-money call warrants with market value amounting to RM20 million in a corporation listed on G10 stock exchange. The banking institution's Total Capital is currently RM500 million and the total issued paid-up capital of the corporation is RM100 million. All the exposures are held in the trading book.

Step 1

Determine the amount in excess of threshold. The LERR computation will be based on exposures to a single equity exceeding 15% of the banking institution's Total Capital or 10% of the issuer's paid-up capital, whichever is lower.

	LERR threshold (RM million)	**Amount within threshold (RM million)**	**Amount in excess of lowest threshold (RM million)**	**Total exposures (RM million)**
Based on banking institution's Total Capital	500 x 15% = 75		Not applicable.	
Based on issuer's paid-up capital	100 x 10% = 10	10	10	20

Step 2

Calculate the LERR capital charge by multiplying the market value of the equity position in excess of the threshold, with the sum of the corresponding general and specific risk weights as per the market risk component of the Capital Adequacy Framework. The LERR capital requirement is incurred in addition to the market risk capital charge for large exposures to a single equity.

Market risk capital charge RM20 million x (8% + 8%)
= RM3.2 million
LERR capital charge RM10 million x (8% + 8%)
= RM1.6 million

Step 3

Calculate the LERR risk-weighted asset.

LERR risk-weighted asset RM1.6 million x 12.5

= RM20 million

Scenario B

A banking institution holds preference shares with market value amounting to RM80 million in an unlisted corporation. The banking institution's Total Capital is currently RM500 million and the total issued paid-up capital of the corporation is RM1 billion. All the exposures are held in the banking book.

Step 1

Determine the amount in excess of the lowest threshold.

	LERR threshold (RM million)	**Amount within threshold (RM million)**	**Amount in excess of lowest threshold (RM million)**	**Total exposures (RM million)**
Based on banking institution's Total Capital	500 x 15% = 75	75	5	80
Based on issuer's paid-up capital	1000 x 10% = 100	Not applicable		

Step 2

Calculate the LERR risk-weighted asset by multiplying the market value of the equity exposure (banking book position) in excess of the threshold with the corresponding risk weight, i.e.100%.

Credit risk-weighted asset	RM80 million x 100% =RM80 million
LERR risk-weighted asset	RM5 million x 100% = RM5 million

Appendix XIX Capital Treatment for Sell and Buyback Agreement (SBBA)/ Reverse SBBA Transactions

The capital treatment for exposures from SBBA and reverse SBBA transactions under the banking book and trading book is provided below:

SBBA	Reverse SBBA[308]
Trading book transaction	
1) Market risk in the forward purchase transaction • For cash position: a. General risk for the short cash position b. There is no specific risk charge for the cash position • For the underlying asset of the forward purchase transaction a. General risk for the underlying asset b. Specific risk for the underlying asset 2) Counterparty credit risk (as per the banking book treatment below).	1) Market risk in the forward sale transaction • General risk for the long cash position 2) Counterparty credit risk (as per the banking book treatment below)

[308] In addition to the capital charge applied here, if an arrangement that could effectively transfer the risk back to the SBBA seller is not legally binding, the SBBA buyer is required to provide for credit risk charge of the underlying asset.

SBBA	Reverse SBBA[292]
Banking book transactions	
Standardised Approach for Credit Risk	
1) Credit risk in the underlying asset in the forward purchase transaction • Credit RWA = Underlying asset value x CCF of forward asset purchase (i.e. 100%) x risk weight based on recognised issue / issuer rating of the asset. 2) Counterparty credit risk in the forward purchase transaction • Credit RWA = Credit equivalent amount (derived from the Current Exposure Method) x risk weight of counterparty. **Note:** The 'positive MTM' amount refers to the difference between the underlying asset market value and forward purchase transaction value, <u>where</u> the underlying asset market value **>** the forward purchase transaction value.	1) Counterparty credit risk in the forward purchase transaction • Credit RWA = Credit equivalent amount (derived from the Current Exposure Method) x risk weight of counterparty. **Note:** The 'positive MTM' amount refers to the difference between the underlying asset market value and forward sale transaction value, <u>where</u> the underlying asset market value **<** the forward sale transaction value.
Internal Ratings-Based Approach for Credit Risk	
1) Credit risk in the underlying asset in the forward purchase transaction • EAD = Underlying asset value x CCF of forward asset purchase (i.e., 100%). EAD is to be used in capital formula to obtain the capital charge. 2) Counterparty credit risk in the forward purchase transaction • EAD = Credit equivalent amount (derived from the Current Exposure Method). EAD is to be used in capital	1) Counterparty credit risk in the forward sale transaction EAD = Credit equivalent amount (derived from the Current Exposure Method). EAD is to be used in capital formula to obtain the capital charge. **Note:** The 'positive MTM' amount refers to the difference between the underlying asset market value and forward sale transaction value, <u>where</u> the forward sale transaction value **>** the underlying asset market

formula to obtain the capital charge. **Note:** The 'positive MTM' amount refers to the difference between the underlying asset market value and forward purchase transaction value, where the underlying asset market value **>** the forward purchase transaction value.	value.

The underpinning basis for the capital treatment for SBBA and reverse SBBA transactions is the risk profile of the underlying transactions i.e. outright sale/ buy contract as well as forward transactions as *waad* (promise) to buyback/ sellback. Hence, while SBBA and reverse SBBA are not securities financing transactions, the treatment prescribed for securities financing transactions (e.g. requirements on maturity and floor) is also applicable to SBBA and reverse SBBA except for treatment on credit risk mitigation (**Part B.2.5** and **Part B.3.4** respectively).

Appendix XX Securitisation Framework – Definitions and General Terminology

Asset-backed commercial paper (ABCP) programme

An ABCP programme predominately issues commercial paper with an original maturity of one year or less that is backed by assets or other exposures held in a bankruptcy-remote SPV.

Asset-backed Sukuk

Risk and reward are dependent on the underlying asset.

Asset-based Sukuk

Risk and reward are dependent on the obligor that originates/issues the instrument.

Assignment

An assignment may also achieve an effective transfer of the seller's rights to the principal sum and interest, usually with the exclusion of certain obligations. However, there is potential risk that some rights may not be effectively assigned, thus resulting in the impairment of the buyer's entitlements to certain rights accrued between the borrower and the seller, such as the late payment fee, prepayment charges, late interest charges, repossession of collateral, and set-off arrangements (for example, netting of obligations). Another constraint is the restriction on the assignability of loans that may be imposed in loan agreements prohibiting any assignment to third parties without the consent of the parties to the agreement.

In the case of a legal assignment, the seller will notify the borrower that the rights to the assets are being assigned to the buyer. This notification will ensure that the buyer's rights are not impaired by other intervening rights, or at the minimum, the seller should provide a warranty that all rights to the principal sum and interest are being assigned and no other right exists.

In the case of an equitable assignment where notice of the transfer is not given to the borrowers (due to impracticality, etc.), the SPV buyer and consequently the investors are exposed to potential legal risks (where the transfer is not perfected). For example,

investors may lose priority to the holder of a legal assignment that may be created subsequently by the seller/originator. Another legal risk concerns the fact that the buyer or investor may not have direct rights against the borrower and needs to join the seller/originator in any legal action initiated against the borrower with respect to the receivables. Similarly, in cases where a borrower's obligation is offset with its deposit (that is, enforceable on-balance sheet netting), unless the SPV's claim is perfected, there is a risk that the SPV may not be entitled to the full amount due from the borrower.

Credit enhancement

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

Credit-enhancing interest-only strip

A credit-enhancing interest-only strip is an on-balance sheet asset that represents a valuation of cash flows related to future margin income and is subordinated.

Excess spread

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

Future margin income (FMI)

The amount of income anticipated to be generated by the relevant exposures over a certain period of time that can reasonably be assumed to be available to cover potential credit losses on the exposures (i.e. after covering normal business expenses). FMI usually does not include income anticipated from new accounts.

Gain-on-sale

Gain-on-sale is any residual interest retained by the originating banking institution that is, an on-balance sheet asset that represents a retained beneficial interest in a securitisation accounted for as a sale, and that exposes the originating banking

institution to any credit risk directly or indirectly associated with the transferred asset, that exceeds a pro rata share of that originating banking institution's claim on the asset.

Investment grade

A securitisation exposure is deemed to be of investment grade if an ECAI recognised by the Bank has assigned it a rating within long-term rating categories 1 to 3, or short-term rating categories 1 to 3 (as defined in **Appendix III**).

Novation

The transfer involves a tripartite arrangement whereby the two parties to the original contract, the originator and the borrower, agree with the SPV that the SPV shall become a substitute for the originator thus assuming the originator’s rights and obligations under the original contract. This method is considered the cleanest transfer. However, it may involve legal procedures and requirements such as obtaining the signature of borrowers as a party to the novation agreement effecting the transfer of assets and titles, legal fees, stamp duty, etc.

Originating banking institution

A banking institution is considered to be an originator in a securitisation transaction if it meets either of the following conditions:

– The banking institution originates directly or indirectly (e.g. a banking institution purchases a third party financial instrument via its balance sheet or acquires credit risk through credit derivatives and subsequently sells or transfers to an SPV) the underlying exposures included in the securitisation; or

– The banking institution serves as a sponsor of an ABCP conduit or similar programme that acquires exposures from third-party entities. In the context of such a program, a banking institution would generally be considered a sponsor and, in turn, an originator if it, in fact or in substance, manages or advises the programme, places securities into the market, or provides liquidity and/or credit enhancements.

Residual interest

Residual interest can take several forms such as credit-enhancing interest-only strips, spread accounts, cash collateral/reserve accounts, retained subordinated interests and other forms of over-collateralisation, accrued but uncollected interest on transferred assets (presumably in credit card securitisations) that when collected, will be available to serve in a credit-enhancing capacity. Residual interests generally do not include interests purchased from a third party other than the purchased credit-enhancing interest-only strips.

Revolving exposures

Credit exposures where the borrower is permitted to vary the drawn amount and repayments within an agreed limit under a line of credit (e.g. credit card receivables and corporate loan commitments).

Servicer

A servicer is one (typically the originating banking institution) that manages the underlying credit exposures of a securitisation on a day-to-day basis in terms of collection of principal and interest, which is then forwarded to investors in the securitisation transaction.

Special purpose vehicle (SPV)

An SPV is an entity set up for a specific purpose, the activities of which are limited to those necessary to accomplish the purpose of the SPV, and the structure of which is intended to isolate the SPV from the credit risk of an originator or seller of the exposures. SPVs are commonly used as financing vehicles in which exposures are sold to a SPV or similar entity in exchange for cash or other assets funded by debt issued by the SPV. Such SPVs are used as a conduit for risk transfer purposes in the case of synthetic securitisation.

Synthetic securitisation

A synthetic securitisation is a structure with at least two different stratified risk positions or tranches that reflect different degrees of credit risk. The structure involves the transfer of credit risk of an underlying pool of exposures by the originator, in whole

or in part, using CRM tools such as credit-linked notes, credit default swaps or guarantees to hedge the credit risk of the underlying exposures. Accordingly, the investors are exposed to the risk and performance of the underlying exposures.

Traditional securitisation

A traditional securitisation involves a transfer of an underlying pool of exposures to a SPV which issues asset-backed securities to capital market investors. The cash flow generated from the underlying pool of exposures is used to service at least two different stratified risk positions or tranches reflecting different degrees of credit risk. Investors are exposed to the risk and performance of the specified underlying exposures rather than the performance of the originator of the underlying exposures.

Appendix XXI Legal and Regulatory Requirements

Specific legal and regulatory requirements

Sale/transfer of assets – Section 49 of BAFIA

Pursuant to Section 49(1)(b) of BAFIA, a banking institution is required to obtain the prior approval of the Minister of Finance (MOF) for the sale, disposal or transfer of the whole or any part of its business. However, for purposes of securitisations by banking institutions, the MOF has exempted licensed institutions from Section 49(1)(b) of BAFIA effective from 18 April 2002, subject to compliance with all regulatory requirements relating to securitisation and any other relevant conditions as may be specified by the Bank.

While licensed institutions may adopt various methods of legal transfer (please refer to **Appendix XX** for examples of methods of legal transfer), the method employed should seek to minimise legal risks to the originating banking institution. Regardless of the method to be adopted for the transfer, all potential legal risks must be identified and adequately disclosed, when and where appropriate (for example, in the information memorandum for investors).

Scheduled business – Section 19 of BAFIA

An SPV that is established for the purpose of asset securitisation is not deemed to be carrying on a scheduled business under Section 19 of BAFIA, provided that the scheme has obtained all necessary approvals from relevant authorities and undertakes a ‘one-off’ transaction. An SPV that is not established to undertake a ‘one-off’ transaction is required to be registered with the Bank.

Secrecy requirements – Sections 97 and Section 99 of BAFIA

Pursuant to Section 97 of BAFIA, a licensed institution is not permitted to disclose to any person, information or documents relating to the affairs of its customers. Prior consent of the Bank must be obtained under Section 99(1)(i) of BAFIA for the disclosure of borrowers-related information, to third parties to facilitate the necessary procedures to effect securitisation transactions such as due diligence and credit rating assessments. In cases where loan documentation already provides for customers’

consent for the disclosure of his information, the Bank's approval pursuant to Section 99(1)(i) of BAFIA is not required.

The Bank may grant approval, on a case-by-case basis, pursuant to Section 99(1)(i) of BAFIA, to legal counsel, reporting accountants, and any other parties as the case may require, specifically appointed to facilitate the conduct of due diligence processes or credit rating assessments. Applications for approval should include the following information:

– Time period required by the legal counsel and accountants to conduct the due diligence (for revolving securitisation schemes, the Bank may grant such approval for the entire 'revolving period');
– Names of legal and accounting firms including names and identity card numbers of individual staff involved in the exercise; and
– Justification for the need to disclose customer information to the identified parties.

In the case where approval is obtained under Section 99(1)(i) of BAFIA, licensed institutions must incorporate in the sale and purchase agreement, the requirement for the buyer/SPV to preserve the confidentiality of customers' information. Should due diligence become necessary in the case of an asset replenishment, a separate approval under Section 99(1)(i) of BAFIA should be sought unless the customers' consent has already been obtained earlier.

Disclosure requirements for loans disposed under the Debt Management Programme

Banking institutions that dispose loans which are under the Debt Management Programme (DMP) of the Credit Counselling and Debt Management Agency are required to take appropriate actions to secure the commitment of buyers of the loans to continue to abide by the terms and conditions of the DMP, as long as the borrower continues to comply with the DMP. Banking institutions should also ensure that borrowers are informed of the disposal of their loan to third parties, irrespective of whether prior consent has been obtained from the borrower for the sale or transfer of their loan.

Regulatory capital relief

Originating banking institutions applying for capital relief for their securitisation transactions are required to submit the following to the Bank:

– A **confirmation of compliance** by senior management against the operational requirements for traditional or synthetic securitisation, as outlined in **Part F.2**. The statement should be supported by relevant information e.g. legal opinion confirming the legality of the sale of assets or enforceability of the contracts.

– A **risk management self assessment**, in line with the requirements of paragraph 6.2 of the Prudential Standards on Securitisation Transactions, which details information regarding:

  - the role(s) of the banking institution in the securitisation transaction describing the purpose, nature, extent and risk implications arising from the role(s); and
  - risk management policies and procedures that will be implemented to address any potential risk issues.

The above submission to the Bank should be validated and signed-off by an appropriate level of authority within senior management of the banking institution.

Regulatory process and submission of applications to Bank Negara Malaysia

Regardless of whether capital relief is being sought or not, the following transaction information should be maintained by originating banking institutions upon the completion of the transaction (issuance of notes), and made available to the Bank upon request:

– Final rating report;
– Principal terms and conditions of transaction;
– Information memorandum;
– Legal opinion of true sale;
– Opinion of accounting treatment;
– The latest risk management self assessment in accordance with paragraph 6.2 of the Prudential Standards on Securitisation Transactions.

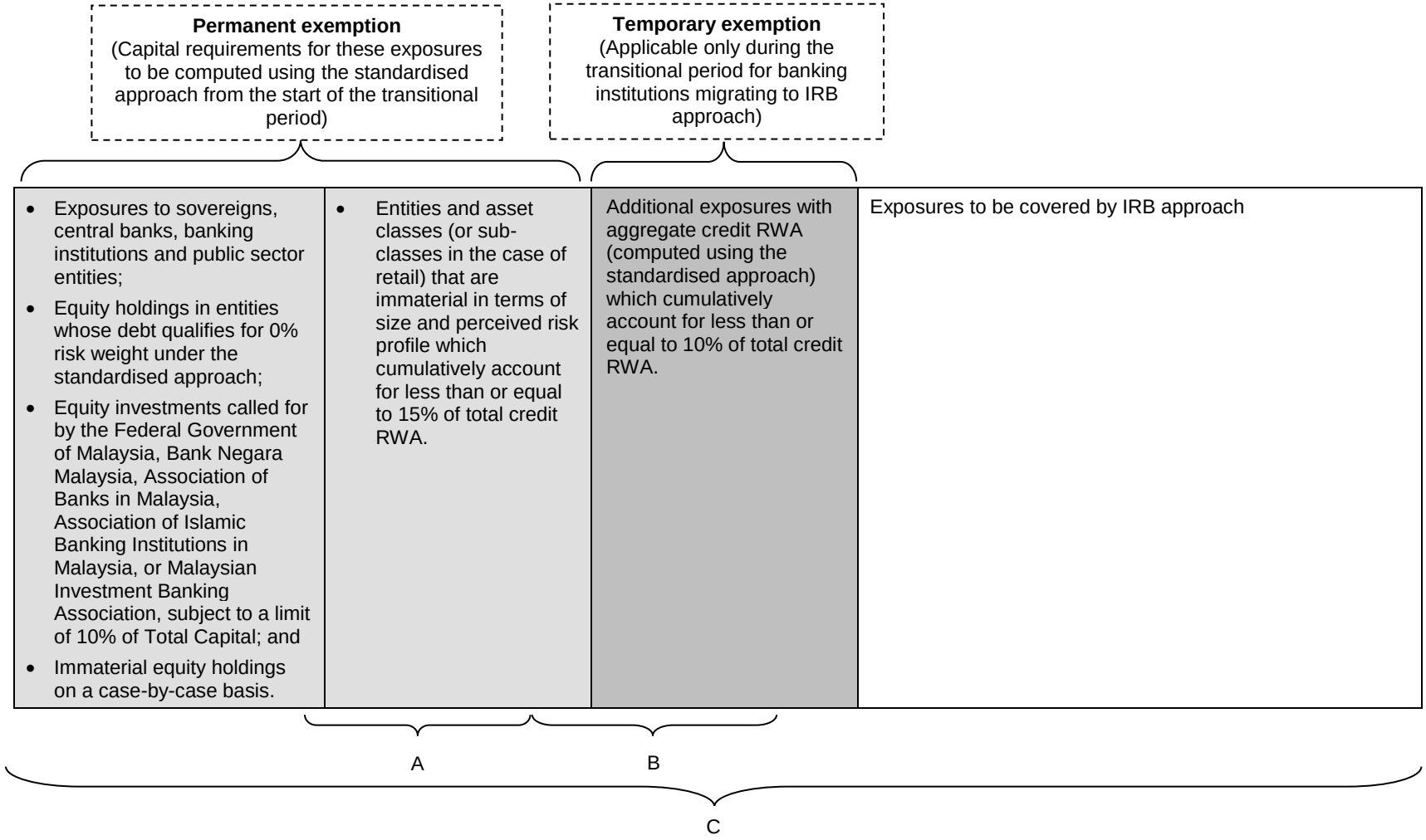
Where relevant, regulatory applications should be directed to:

Pengarah
Jabatan Penyeliaan Perbankan or
Jabatan Penyeliaan Konglomerat Kewangan (as applicable)
Bank Negara Malaysia
Jalan Dato' Onn
50480 Kuala Lumpur

Where section 214 or 216 of the FSA applies to securitisation transactions, banking institutions shall ensure that the necessary approvals, if any, on such matters are sought from:

Pengarah
Jabatan Pentadbiran Pertukaran Asing
Bank Negara Malaysia
Jalan Dato' Onn
50480 Kuala Lumpur

Appendix XXII IRB Coverage



The next section provides an illustration on how banking institutions should compute “A” and “B” for purposes of the IRB coverage requirement

The computation for the IRB coverage requirement is as follows:

$$\text{Cumulative Immaterial Exposures} = \frac{\text{“A”}}{\text{“C”}} \leq 15\%$$

Or

$$\text{Cumulative Immaterial Exposures} = \frac{\text{“A” + ”B”}}{\text{“C”}} \leq 25\%$$

Appendix XXIII Assessment of Credit Risk based on Shariah Contracts

1. This appendix sets out the specificities of Islamic financial products or transactions that are undertaken based on specific *Shariah* contracts and stages for identification of the credit risk exposure.

2. Islamic transactions can generally be classified into four main categories as follows:
   i) Asset-based transactions, which comprise of *Murābahah*, *Salam* and *Istisnā`* contracts, that are mainly structured or created based on the purchase or sale of assets;
   ii) Lease-based transactions, which comprise of *Ijārah* contracts;
   iii) Equity-based transactions, which comprise of *Mushārakah* and *Mudārabah* contracts, that are undertaken mainly based on equity participation in a joint venture or business enterprise; and
   iv) Loan-based transactions, which are primarily undertaken through the *Qardh* contract.

3. The innovation in Islamic banking products and financial instruments has resulted in the development of varied product structures which are differentiated by a unique product name. For example, some products are structured using a combination of *Shariah* permissible terms. For capital adequacy computation purposes, the capital treatments on these financial instruments shall be assessed based on the analysis of the risk profile embedded within these transactions rather than the product name, unless specifically required by the Bank.

MURĀBAHAH

Murābahah

4. A *Murābahah* contract refers to an agreement whereby a banking institution sells to a customer an asset that it has acquired at an agreed selling price between both parties. The agreed selling price is based on the acquisition cost (purchase price plus other direct costs) of the asset incurred by the banking institution and a profit margin agreed between the banking institution and its customer. The *Murābahah* contract shall include the agreed repayment terms where the customer is obliged to pay the selling price after taking delivery of the asset.

5. Banking institutions are exposed to credit risk in the event that the customer fails to pay the agreed selling price in accordance with the agreed repayment terms under the *Murābahah* contract. Hence, banking institutions shall be subject to the capital charge for credit risk exposure once the asset is sold and payment is due to the Islamic banking institution.

Murābahah for Purchase Orderer (MPO)

6. A *Murābahah for Purchase Orderer* (MPO) contract refers to an agreement whereby a banking institution sells to a customer at an agreed selling price, a specified type of asset that has been acquired by the banking institution based on an agreement to purchase (AP) by the customer which can be binding or non-binding. The relevant legal recourse provided under the AP that requires the customer to perform their obligation to purchase the underlying asset from the banking institution shall be a key determinant for the AP to be recognised as binding or non-binding. Thus, it is pertinent for banking institutions to ensure the adequacy and enforceability of the legal documentation under the MPO contract. The MPO contract shall include the agreed repayment terms where the customer is obliged to pay the selling price after taking delivery of the asset.

7. The difference between a *Murābahah* transaction and an MPO transaction is that under a *Murābahah* contract, the Islamic banking institution sells an asset which is already in its possession, whilst in an MPO, the banking institution acquires an asset in anticipation that the asset will be purchased by the customer.

8. Banking institutions are exposed to credit risk in the event that the customer fails to pay the agreed selling price in accordance with the agreed repayment terms under the MPO contracts. Hence, banking institutions shall be subject to the capital charge for credit risk exposure once the asset is sold and payment is due to the Islamic banking institution.

9. For *MPO* with binding AP, banking institutions are exposed to credit risk in the event that the customer (purchase orderer) defaults on its binding obligation to purchase the assets under the contract. In view of the adequate legal recourse that requires the customer to purchase the asset at an agreed price, the credit risk exposure commences once the banking institution acquires the underlying asset. For non-binding MPO, the effect is similar to a *Murābahah* transaction.

BAI' BITHAMAN AJIL (BBA) AND BAI' INAH

10. For the purpose of this framework, the *Bai` Bithaman Ajil* (BBA) and *Bai` Inah* contracts are deemed to have similar transaction characteristics and financing effects as the *Murābahah* and MPO contract. The BBA involves the selling of an asset with deferred payment terms while Bai' Inah involves a sell and buy back agreement. An example of Bai' Inah is where a customer sells to the banking institution an asset at a selling price that will be repaid on cash basis for the first leg of the agreement. On the second leg, the Islamic banking institution sells back the asset to the customer on deferred payment terms to enable the financing transaction.

IJĀRAH

Ijārah

11. *Ijārah* contracts refer to a lease agreement whereby the lessor transfers the right to use (or usufruct) of the leased asset to the lessee, for an agreed period and at an agreed consideration, in the form of lease rental. The lessor maintains ownership of the leased asset during the lease period under these contracts.

12. As the owner of the leased asset, Banking institutions therefore assume all liabilities and risks pertaining to the leased asset including the obligation to restore any impairment and damage to the leased asset arising from wear and tear, as well as natural causes which are not due to the lessee's misconduct or negligence.

13. As a lessor, banking institutions may acquire the asset to be leased based on the lessee's specifications as stipulated under the agreement to lease (AL), prior to entering into the *Ijārah* contract with the lessee. The AL can be binding or non-binding on the lessee depending on the legal recourse in the AL, which states the obligation for the lessee to lease the specified asset from the lessor.

14. Banking institutions as the lessor under the *Ijārah* contracts are exposed to the credit risk of the lessee in the event that the lessee fails to pay the rental amount as per the agreed terms.

15. In addition, under a binding AL, Banking institutions are exposed to credit risk in the event that the lessee (lease orderer) defaulting on its binding obligation to execute the *Ijārah* contract. In this situation, the Banking institution may lease or dispose off the asset to another party. However, the Banking institution is also exposed to the credit risk of the lessee if the lessee is not able to compensate for the losses incurred arising from the disposal of the asset.

16. Under a non-binding AL, the Banking institution is not exposed to the risk of non-performance by the lease orderer given that the Banking institution does not have legal recourse to the lease orderer. In this regard, credit risk exposure arises upon the commencement of rental agreement.

Ijārah Muntahia Bittamleek

17. *Ijārah Muntahia Bittamleek* (IMB) contract refers to a lease agreement similar to *Ijārah* contracts. However, in addition to paragraphs 11 to 16, the lessor has an option to transfer ownership of the leased asset to the lessee in the form of a gift or a sale transaction at the end of IMB.

Al-Ijārah Thumma Al-Bai`

18. *Al-Ijārah Thumma Al-Bai`* (AITAB) contract is a type of IMB contract that ends with a transfer of ownership to the lessee by way of a sale transaction and shall be treated similarly to the IMB contract for purposes of capital adequacy requirements.

SALAM

19. A *Salam* contract refers to an agreement whereby a banking institution purchases from a customer a specified type of commodity, at a predetermined price, which is to be delivered on a specified future date in a specified quantity and quality. Banking institution as the purchaser of the commodity makes full payment of the purchase price upon execution of the *Salam* contract. Banking institutions are exposed to credit risk in the event that the customer (commodity seller) fails to deliver[309] the paid commodity as per the agreed terms.

20. In addition, a banking institution may also enter into a parallel *Salam* contract, which is a back-to-back contract to sell the commodity purchased under the initial

[309] Delivery risk in a *Salam* contract is measured based on the commodity seller's credit risk.

Salam contract to another counterparty. This arrangement enables the banking institution to mitigate the risk of holding the commodity.

21. Banking institutions undertaking the parallel *Salam* transaction are exposed to credit risk in the event that the purchaser fails to pay for the commodity it had agreed to purchase from the banking institution. Nevertheless, in the event of non-delivery of the commodity by the seller under the initial *Salam* contract, the banking institution is not discharged of its obligation to deliver the commodity to the purchaser under the parallel *Salam* contract.

ISTISNĀ`

22. An *Istisnā`* contract refers to an agreement to sell to or buy from a customer an asset which has yet to be manufactured or constructed. The completed asset shall be delivered according to the buyer's specifications on a specified future date and at an agreed selling price as per the agreed terms.

23. As a seller of the under the *Istisnā`* contract, the banking institution is exposed to credit risk in the event that the customer fails to pay the agreed selling price, either during the manufacturing or construction stage, or upon full completion of the asset.

24. As a seller, the banking institution has the option to manufacture or construct the asset on its own or to enter into a parallel *Istisnā`* contract to procure the asset from another party or, to engage the services of another party to manufacture or construct the asset. Under the parallel *Istisnā`* contract, as the purchaser of the asset, the banking institution is exposed to credit risk in the event that the seller fails to deliver the specified asset at the agreed time and in accordance with the initial *Istisnā`* ultimate buyer's specifications. The failure of delivery of completed asset by the parallel *Istisnā`* seller does not discharge the banking institution from

its obligations to deliver the asset ordered by the customer under the initial *Istisnā`* contract. Thus, the banking institution is additionally exposed to the potential loss of making good the shortcomings or acquiring the specified assets elsewhere.

MUSHĀRAKAH

25. A *Mushārakah* contract is an agreement between a banking institution and its customer to contribute an agreed proportion of capital funds to an enterprise or to acquire ownership of an asset/real estate. The proportion of the capital investment may be on a permanent basis or, on a diminishing basis where the customer progressively buys out the share of the banking institution (thus, this contract is named Diminishing *Mushārakah,* which is categorized under *Mushārakah* contract for the purpose of this framework). Profits generated by the enterprise or an asset/real estate are shared in accordance to the terms of the *Mushārakah* agreement, while losses are shared based on the capital contribution proportion.

26. In general, *Mushārakah* contracts can broadly be classified into two categories as follows:

    i) Equity participation in a private commercial enterprise to undertake business ventures or financing of specific projects; and

    ii) Joint ownership in an asset or real estate.

I. EQUITY PARTICIPATION IN A PRIVATE COMMERCIAL ENTERPRISE TO UNDERTAKE BUSINESS VENTURES OR FINANCING OF SPECIFIC PROJECTS

27. A banking institution may enter into a *Mushārakah* contract with their customer to provide an agreed amount of capital for the purpose of participating in the equity ownership of an enterprise. In this arrangement, the banking institution is

exposed to capital impairment risk in the event that the business activities undertaken by the enterprise incur losses. The *Mushārakah* agreement may provide an agreed 'exit mechanism' which allows partners to divest their interest in the enterprise at a specified tenor or at the completion of the specified project. In this regard, the banking institution must ensure that the contract clearly stipulates the exit mechanism for partners to redeem their investment in this entity.

28. Banking institutions that enter into this type of *Mushārakah* contract are exposed to the risk similar to an equity holder or a joint venture arrangement where the losses arising from the business venture are to be borne by the partners. As an equity investor, the banking institution serves as the first loss absorber and its rights and entitlements are subordinated to the claims of creditors. In terms of risk measurement, the risk exposure to an enterprise may be assessed based on the performance of the specific business activities undertaken by the joint venture as stipulated under the agreement.

II. JOINT OWNERSHIP IN AN ASSET OR REAL ESTATE

29. *Mushārakah* contracts that are undertaken for the purpose of joint ownership in an asset or real estate may generally be classified into the two categories as follows:

i) *Mushārakah* contract with an *Ijārah* sub-contract

- Partners that jointly own an asset or real estate may undertake to lease the asset to third parties or to one of the partners under an *Ijārah* contract and therefore generate rental income to the partnership. In this case, the risk profile of the *Mushārakah* arrangement is essentially determined by the underlying *Ijārah* contract. Banking institutions are exposed to credit risk in the event that the lessee fails to service the lease rentals.

ii) *Mushārakah* contract with a *Murābahah* sub-contract

- As a joint owner of the underlying asset, banking institutions are entitled to a share of the revenue generated from the sale of asset to a third party under a *Murābahah* contract. Banking institutions are exposed to credit risk in the event the buyer or counterparty fails to pay for the asset sold under the *Murābahah* contract.

iii) Diminishing *Mushārakah*

- A banking institution may enter into a Diminishing *Mushārakah* contract with a customer for the purpose of providing financing based on a joint ownership of an asset, with the final objective of transferring the ownership of the asset to the customer in the contract.

- The contract allows the customer to gradually purchase the banking institution's share of ownership in an asset/real estate or equity in an enterprise over the life of the contract under an agreed repayment terms and conditions which reflect the purchase consideration payable by the customer to acquire the banking institution's share of ownership.

- As part of the mechanism to allow the customer to acquire the banking institution's share of ownership, the banking institution and customer may agree to lease the asset/real estate to the customer. The agreed amount of rental payable can be structured to reflect the progressive acquisition of the banking institution's share of ownership by the customer. Eventually, the full ownership of the asset will be transferred to the customer as it continues to service the rental payment. In this regard, the banking institution is exposed to credit risk similar to an exposure under the *Mushārakah* with *Ijārah* contract.
- However, if the exposure under the Diminishing *Mushārakah* contract consists of share equity in an enterprise, the banking institution shall measure its risk exposure using the treatment for equity risk.

MUDĀRABAH

30. A *Mudārabah* contract is an agreement between a banking institution and a customer whereby the banking institution contributes a specified amount of capital funds to an enterprise or business activity that is to be managed by the customer as the entrepreneur *(Mudārib).* As the capital provider, the banking institution is at risk of losing its capital investment (capital impairment risk) disbursed to the *Mudārib*. Profits generated by the enterprise or business activity are shared in accordance with the terms of the *Mudārabah* agreement whilst losses are borne solely by the banking institution (capital provider)[310]. However, losses due to misconduct, negligence or breach of contracted terms[311] by the entrepreneur, shall be borne solely by the *Mudārib*. In this regard, the amount of capital invested by the banking institution under the *Mudārabah* contract shall be treated similar to an equity exposure.

[310] Losses borne by the capital provider would be limited to the amount of capital invested.
[311] Banking institutions are encouraged to establish and adopt stringent criteria for definition of misconduct, negligence or breach of contracted terms.

31. *Mudārabah* transactions can be carried out:

    i) on a restricted basis, where the capital provider authorises the *Mudārib* to make investments based on a specified criteria or restrictions such as types of instrument, sector or country exposures; or

    ii) on an unrestricted basis, where the capital provider authorises the *Mudārib* to exercise its discretion in business matters to invest funds and undertake business activities based on the latter's skills and expertise.

32. In addition, transactions involving *Mudārabah* contracts may generally be sub-divided into two categories as follows:

I. *EQUITY* PARTICIPATION IN AN ENTITY TO UNDERTAKE BUSINESS VENTURES

This type of *Mudārabah* contract exposes the banking institution to risks akin to an equity investment, which is similar to the risk assumed by an equity holder in a venture capital or a joint-venture investment. As an equity investor, the banking institution assumes the first loss position and its rights and entitlements are subordinated to the claims of creditors.

II. *INVESTMENT IN PROJECT FINANCE*

The banking institution's investment in the *Mudārabah* contract with a *Mudārib* is for the purpose of providing bridging finance to a specific project. This type of contract exposes the banking institution to capital impairment risk in the event that the project suffers losses. Under this arrangement, the banking institution as an investor provides the funds to the construction company or *Mudārib* that manages the construction project and is entitled to share the profit of the project in accordance to the agreed terms of the contract and must bear the full losses (if any) arising from the project.

33. There may be situations where the risk profile of money market instruments based on *Mudārabah* contracts may not be similar to an equity exposure given the market structure and regulatory infrastructure governing the conduct of the market. In particular, *Mudārabah* interbank investments in the domestic Islamic money market would attract the credit risk of the banking institution instead of equity risk despite having similarities in the contractual structure.

QARDH

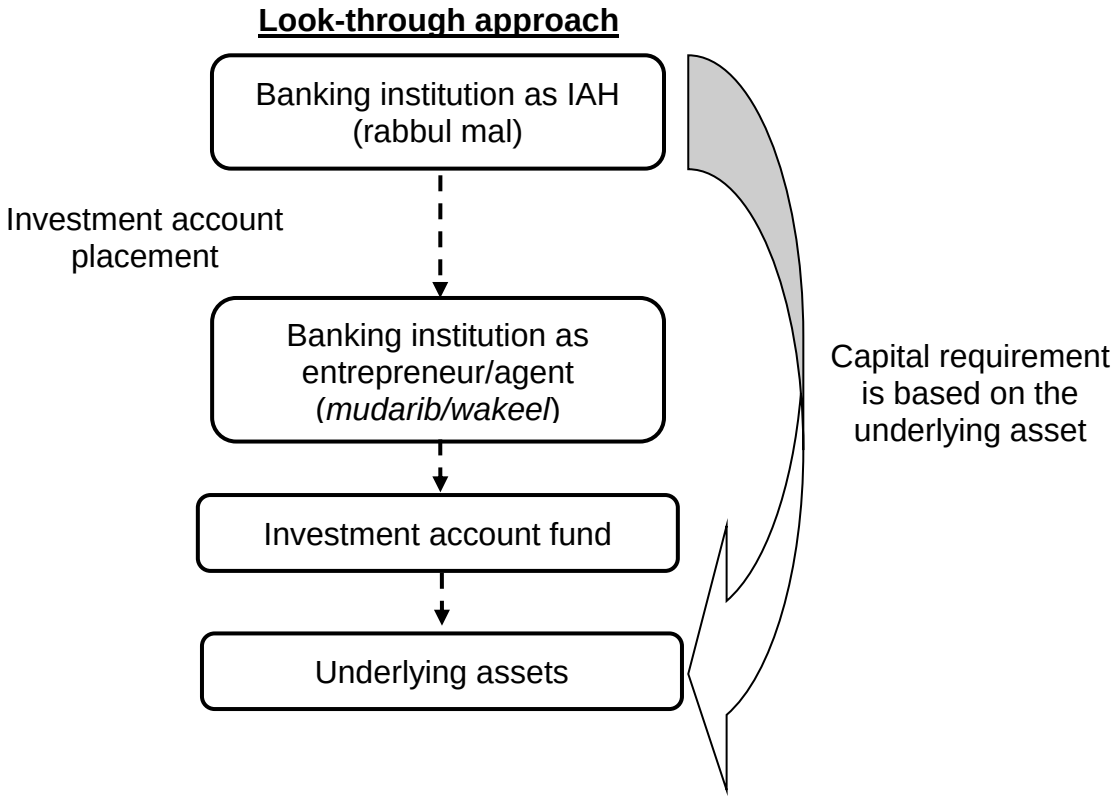
34. *Qardh* is a loan given by a banking institution for a fixed period, where the borrower is contractually obliged to repay only the principal amount borrowed. In this contract, the borrower is not obligated to pay an extra amount (in addition to the principal amount borrowed) at his absolute discretion as a token of appreciation to the banking institution.

35. Banking institutions are exposed to credit risk in the event that the borrower fails to repay the principal loan amount in accordance to the agreed repayment terms. Hence, the credit risk exposure commences upon the execution of the *Qardh* contract between the banking institution and the borrower.

Appendix XXIV Capital Treatment for Investment Accounts

The "Look-Through" Approach (LTA)

1. The "look-through" approach refers to the calculation of credit and market risk capital requirements based on the underlying assets funded by an investment account, as illustrated below:



2. Where a banking institution is an Investment Account Holder (IAH), the banking institution shall apply the LTA only when the following conditions are met:

   (i) the financial information about the underlying assets is maintained at a sufficiently granular level to enable the calculation of the corresponding risk weights[312]; and

[312] The IAH may specify the information required and time period for such disclosure in the investment account agreement with the mudarib/wakeel.

(ii) the financial reports of the investment account funds are prepared at least at the same reporting interval as that of the IAH[312].

3. Under the LTA, the IAH shall calculate the credit and market risk capital requirements of the investment account as if it directly holds the underlying assets using similar approach applied by the IAH on its own assets[313].

Credit risk

(i) Under the standardised approach, the IAH shall calculate the capital requirements based on the risk weight applicable to the obligor of the underlying assets.

(ii) Under the IRB approach, the IAH shall calculate the IRB risk components (i.e. the probability of default (PD) and, where applicable, loss given default (LGD) and exposure at default (EAD)) of the underlying assets. For the avoidance of doubt, the IAH shall use the standardised approach for exposures of the underlying assets that are under the permanent exemptions from the IRB approach.

(iii) The IAH may take into account the effect of any CRM only when the CRM used by the *mudarib/wakeel* fulfils the relevant CRM technique requirements and there is a clear and enforceable legal documentation that ensures the benefit of CRM can be effectively passed to the IAH.

Market risk

(i) Under the standardised approach, the IAH shall apply the specific risk and general risk capital charges applicable to the underlying assets.

(ii) Under the IMA, the IAH shall calculate the capital requirements of the underlying assets using the internal models approved by the Bank.

[313] For example, if the IAH adopts the IRB approach for an asset class, the IAH should apply similar approach for that asset class arising funded by an investment account.

(iii) The IAH may offset its own position against positions arising from the underlying assets provided that the conditions specified in this policy documents are met and that there are no obstacles to timely recoverability of funds from the *mudarib/wakeel* [314].

The alternative approach when the LTA's conditions are not met

4. When the conditions in paragraph 2 are not met, the IAH shall treat the investment account as exposure to equities.

Credit risk

(i) For the standardised approach, apply a risk weight of 150%;

(ii) For the IRB approach, apply a risk weight of 400%; and

Market risk

(i) For the standardised approach, apply a specific risk charge of 14%, in addition to the general risk charge;

(ii) For the IMA, calculate the capital requirements according to internal models for equities.

[314] Consequently, the mudarib/wakeel is not allowed to recognise such position arising from the underlying assets to offset against its own positions.

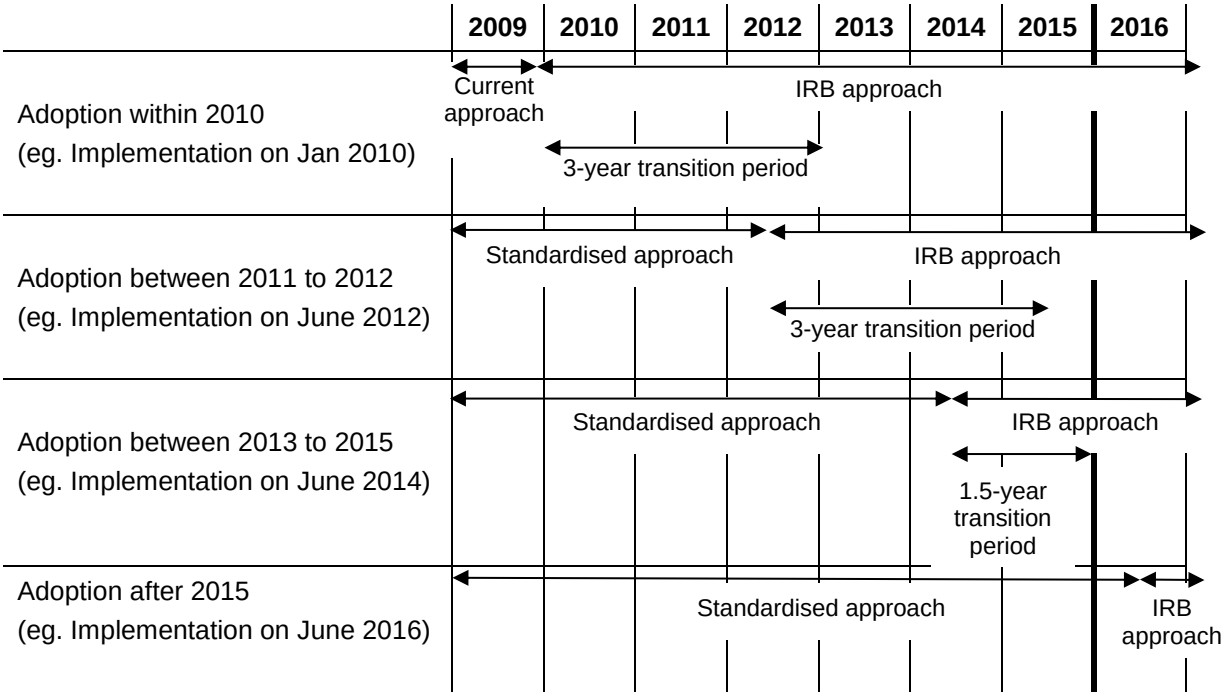
Appendix XXV Transitional Arrangements and Approval Process

Transitional Arrangements

1. Banking institutions adopting the IRB approach before 31 December 2015 will be eligible for a transition period from the date of implementation, as follows:

Implementation Date	Available Transition Period
Between 1 January 2010 to 31 December 2012	3 years
Between 1 January 2013 to 31 December 2015	Less than 3 years commencing from the date of implementation until 31 December 2015
After 31 December 2015	None

2. The following chart provides an illustration of the transitional arrangements applicable for banking institutions implementing the IRB approach based on various timelines:



Approval Process

Approval for Direct Migration from Current Accord

3. For banking institutions granted approval for direct migration, the Bank's assessment focuses mainly on the review of the board-approved detailed overall implementation plan, to ensure that it is adequate, comprehensive, credible and feasible with regard to initial coverage and pace of rollout. In particular:

i) Governance and Sustainability of Implementation

- Banking institutions must demonstrate to the Bank that the implementation of IRB can be sustained. This should include the support of the board, including the allocation of sufficient resources that ensures smooth progress of the IRB implementation.
- Banking institutions must demonstrate that all the necessary capabilities required for the IRB approach are covered in the implementation plan. In other words, the IRB implementation should not be conditional or significantly dependent on capabilities that are implemented outside the IRB implementation plan.

ii) Discipline in Implementation and IRB Coverage Requirement

- Banking institutions are also expected to demonstrate a good track record of adherence to the implementation plan submitted, as well as strict discipline in implementing current initiatives. They need to demonstrate to the Bank that substantive results have been achieved within the scheduled timeframe.
- Banking institutions must ensure that the IRB coverage requirement as stipulated in **Appendix XXII** is adhered to at all times.

iii) Risk Management Capabilities

- Banking institutions with adequate overall risk management[315] would be viewed favourably as the basic building blocks and capabilities would have already been in place. For example, banking institutions that have been using internal ratings in critical decision-making for some time would have less difficulty in meeting the use test requirements of the IRB approach.

Approval for Migration to IRB Approach from the Standardised Approach

4. Banking institutions intending to migrate to the IRB approach from the standardised approach must notify the Bank its intention to migrate at least 3 years before the intended IRB implementation date.

5. Full submission of the information requirements as specified in **Appendix XVI** must reach the Bank at least 2 years before the intended IRB implementation date.

For Implementation before 31 December 2015

6. For these banking institutions, the scope of the Bank's assessment will be wider than that outlined in paragraph 3 of this appendix. The Bank will conduct a full assessment of the implemented IRB systems in the majority of the banking institution's portfolio. In addition, the Bank will also be assessing the banking institution's ability to complete the implementation of IRB over the remainder of its portfolio (i.e. those under temporary exemption) during the transition period.

7. Banking institutions also need to ensure that the IRB coverage requirement should be achieved by 1 January 2016 regardless of when the banking institution migrates to the IRB approach. Details of the transition period and the relaxations are elaborated in paragraphs 3.14 to 3.17 of this framework.

[315] Ratings based on supervisory assessments may be used as a benchmark.

8. The decision for the approval of the migration to the IRB approach will be made within six months of the receipt of the full submission.

For Implementation After the Transition Period (From 1 January 2016 onwards)

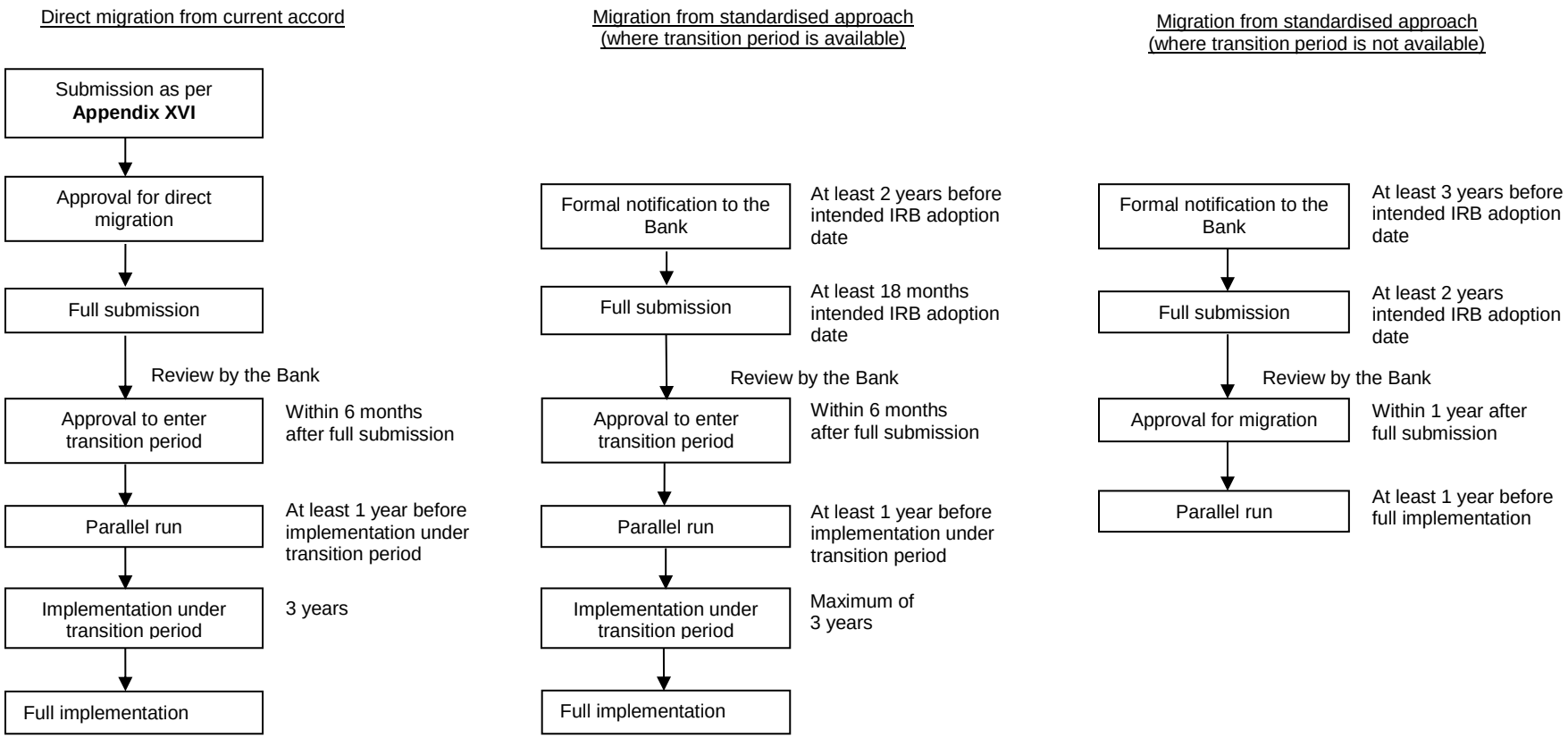
9. From this date onwards, all applications must be accompanied by a full submission of documentation that shows the banking institutions meet all the minimum requirements except for the use of internal rating requirements where the banking institution shall demonstrate a credible track record showing that the rating systems which comply with the minimum requirements have been used for at least 1 year. The banking institutions may utilise the time allocated for the review period by the Bank and parallel run period to fully meet the use of internal ratings requirements[316].

10. The scope of the Bank's assessment will exceed those outlined in paragraphs 3 and 6 of this appendix and will cover the full assessment of all the IRB systems that cover its entire portfolio (except those under permanent exemption).

11. The decision for the approval of the migration to the IRB approach will be made within 1 year upon receipt of the full application from the banking institution.

[316] As required in paragraph 3.375.

Important Milestones for IRB Adoption



Banking institutions are expected to periodically update the Bank on their implementation progress following approval for direct migration and approval to enter into the transition period until full IRB implementation. Frequency of updates will be determined on a case-by-case basis.

Appendix XXVI Credit Conversion Factors for Off-Balance Sheet Items under the IRB Approach

1. Exposure measurement for off-balance sheet items (EAD) under the foundation IRB approach shall be treated similarly to the standardised approach, where the credit risk inherent in each off-balance sheet instrument is translated into an on-balance sheet equivalent (credit equivalent) by multiplying the nominal principal amount with a CCF; and the resulting amount then being weighted according to the risk weight of the counterparty.

2. The CCFs for the various types of off-balance sheet instruments are as follows:

	Instrument	CCF
a.	Direct credit substitutes, such as general guarantees of indebtedness including standby letters of credit serving as financial guarantees for loans and securities, acceptances (including endorsements with the characteristics of acceptances) and credit derivatives (if the banking institution is the protection seller).	100%
b.	Certain transaction-related contingent items, such as performance bonds, bid bonds, warranties and standby letters of credit related to particular transactions.	50%
c.	Short-term self-liquidating trade-related contingencies, such as documentary credits collateralised by the underlying shipments. The credit conversion factor shall be applied to both the issuing and confirming banking institution.	20%
d.	Assets[317] sold with recourse, where the credit risk remains with the selling banking institution.	100%
e.	Forward asset purchases, and partly-paid shares and securities, which represent commitments with certain drawdown.	100%
f.	• 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/borrowing	100%

[317] Item (d), which includes housing loans sold to Cagamas Bhd, and (e) should be weighted according to the type of asset (e.g. housing loan) and not according to the counterparty (i.e. Cagamas) with whom the transaction has been entered into.

	Instrument	CCF
	transactions. • Commitment to buy back Islamic securities SBBA transactions.	
g.	Derivatives contracts.	Credit equivalent to be derived using current exposure method as given in **Appendix VIII**.
h.	Commitments (e.g. formal standby credit facilities), notes issuance facilities (NIFs) and revolving underwriting facilities (RUFs), regardless of maturity.	75%
i.	Any facilities under (h) that are unconditionally and immediately cancellable and revocable by the banking institution or that effectively provide for automatic cancellation due to deterioration in a borrower's creditworthiness (for example, corporate overdrafts and other facilities), at any time without prior notice.	0%, subject to the requirements in paragraphs 3.62 to 3.64 and 3.74.

3. In addition to the computation under item (g) above, counterparty credit risk can also arise from unsettled securities, commodities and foreign exchange transactions from the trade date irrespective of the booking or accounting transaction. Banking institutions are encouraged to develop, implement and improve systems for tracking and monitoring credit risk exposures arising from such unsettled transactions as appropriate for producing management information that facilitates action on a timely basis. When these transactions are not processed via a delivery-versus-payment system (DvP) or a payment-versus-payment (PvP) mechanism, these transactions are subject to a capital charge as calculated in **Appendix IX.**

4. Banking institutions must closely monitor securities, commodities, and foreign exchange transactions that have failed, starting the first day they fail. A capital charge for failed transactions shall be calculated as per **Appendix IX**.

Appendix XXVII Illustrative IRB Risk Weights

1. The following tables provide illustrative risk weights calculated for four asset class types under the IRB approach to credit risk. Each set of risk weights for UL was produced using the appropriate risk weight function of the risk weight functions set out in various parts of **Part B.3.5**. The inputs used to calculate the illustrative risk weights include measures of the PD, LGD, and an assumed effective maturity (M) of 2.5 years.

2. A firm-size adjustment applies to exposures made to small and medium-sized entity (SME) borrowers (defined as corporate exposures where the reported sales for the consolidated group of which the firm is a part is less than RM250 million). Accordingly, the firm size adjustment was made in determining the second set of risk weights provided in column two given that the turnover of the firm receiving the exposure is assumed to be RM25 million.

Illustrative IRB Risk Weights for UL

Asset Class	Corporate Exposures		Residential Mortgages		Other Retail Exposures		Qualifying Revolving Retail Exposures	
LGD: **Maturity: 2.5 years**	45%	45%	45%	25%	45%	85%	45%	85%
Turnover (RM million)	250	25						
PD:								
0.03%	14.44%	11.30%	4.15%	2.30%	4.45%	8.41%	0.98%	1.85%
0.05%	19.65%	15.39%	6.23%	3.46%	6.63%	12.52%	1.51%	2.86%
0.10%	29.65%	23.30%	10.69%	5.94%	11.16%	21.08%	2.71%	5.12%
0.25%	49.47%	39.01%	21.30%	11.83%	21.15%	39.96%	5.76%	10.88%
0.40%	62.72%	49.49%	29.94%	16.64%	28.42%	53.69%	8.41%	15.88%
0.50%	69.61%	54.91%	35.08%	19.49%	32.36%	61.13%	10.04%	18.97%
0.75%	82.78%	65.14%	46.46%	25.81%	40.10%	75.74%	13.80%	26.06%
1.00%	92.32%	72.40%	56.40%	31.33%	45.77%	86.46%	17.22%	32.53%
1.30%	100.95%	78.77%	67.00%	37.22%	50.80%	95.95%	21.02%	39.70%
1.50%	105.59%	82.11%	73.45%	40.80%	53.37%	100.81%	23.40%	44.19%
2.00%	114.86%	88.55%	87.94%	48.85%	57.99%	109.53%	28.92%	54.63%
2.50%	122.16%	93.43%	100.64%	55.91%	60.90%	115.03%	33.98%	64.18%

Asset Class	Corporate Exposures		Residential Mortgages		Other Retail Exposures		Qualifying Revolving Retail Exposures	
LGD: **Maturity: 2.5 years**	45%	45%	45%	25%	45%	85%	45%	85%
Turnover (RM million)	250	25						
3.00%	128.44%	97.58%	111.99%	62.22%	62.79%	118.61%	38.66%	73.03%
4.00%	139.58%	105.04%	131.63%	73.13%	65.01%	122.80%	47.16%	89.08%
5.00%	149.86%	112.27%	148.22%	82.35%	66.42%	125.45%	54.75%	103.41%
6.00%	159.61%	119.48%	162.52%	90.29%	67.73%	127.94%	61.61%	116.37%
10.00%	193.09%	146.51%	204.41%	113.56%	75.54%	142.69%	83.89%	158.47%
15.00%	221.54%	171.91%	235.72%	130.96%	88.60%	167.36%	103.89%	196.23%
20.00%	238.23%	188.42%	253.12%	140.62%	100.28%	189.41% %	117.99%	222.86%

Appendix XXVIII Potential Evidence of Likely Compliance with the Use Test

Essential Areas	Evidence of Likely Compliance
1. Credit approval	▪ Ratings assignment is part of credit analysis and decision, and ▪ Authority level for approval depends on rating
2. Policy	▪ Rating system, estimates, processes and organisational guidelines are all consistent
3. Reporting	▪ Internal ratings, default and loss estimates are used in all reports relating to credit and profitability information at all levels within the organisation, including senior management
4. Capital management	▪ Internal ratings, default and loss estimates are used in internal capital allocation, and in Pillar 2 capital assessment.
5. Risk governance	▪ Individual and portfolio limits are set with reference to internal ratings, default and loss estimates.
6. Pricing decisions	▪ Estimates for regulatory purposes and those derived for risk-based pricing, are produced for senior management's information. However, for actual pricing purposes, banking institution may use estimates which have been aligned with the actual life of the facility.

Appendix XXIX Data-Enhancing and Benchmarking Tools

1. While industry and supervisory practices are still emerging, the Bank views that the preliminary range of data-enhancing and validation tools and techniques summarised below might be useful to facilitate efforts undertaken by banking institutions. Nevertheless, these tools are more applicable to estimation of PDs rather than LGDs or EADs. Additional techniques that are more relevant to LGD and EAD are only expected to emerge over time. Banking institutions are encouraged to consider the list below and to utilise the tools and techniques that are most appropriate to their particular circumstances.

Data-Enhancing Tools for Quantification and Validation

2. While a relative lack of loss data may make it more difficult to use quantitative methods to assess risk parameters, there are tools that could be used to enhance data richness or to determine the degree of uncertainty that could be addressed through conservatism. Among these possible tools are the following:

   i) Pooling of data with other banking institutions or market participants, the use of other external data sources, and the use of market measures of risk can be effective methods to complement internal loss data. While a banking institution would need to satisfy itself and the Bank that these sources of data are relevant to its own situation, the Bank nevertheless believes that in principle, data pooling, external data and market measures can be an effective means to augment internal data in appropriate circumstances. This can be especially relevant for small portfolios or for portfolios where a banking institution is a recent market entrant.

   ii) Internal portfolio segments with similar risk characteristics might be combined. For example, a banking institution might have a broad

portfolio with adequate default history that, if narrowly segmented, could result in the creation of a number of low-default portfolios. While such segmentation might be appropriate from the standpoint of internal use (e.g. pricing), for purposes of assigning risk parameters for regulatory capital purposes it might be more appropriate to combine sub-portfolios.

iii) In some circumstances, different rating categories might be combined and PDs analysed for the combined category. Banking institutions using rating systems that map to rating agency categories might find it useful, for example, to combine AAA, AA and A-rated credits, provided this is done in a manner that is consistent with paragraphs 3.251 and 3.252 of this framework. This could enhance default data without necessarily sacrificing the predictiveness or risk-sensitivity of the rating system.

iv) The upper bound of the PD estimate can be used as an input to the RWA formula for those portfolios where the PD estimate itself is deemed to be too unreliable to warrant direct inclusion in capital adequacy calculations.

v) Banking institutions may derive PD estimates from data with a horizon that is different from one year. Where defaults are spread out over several years, a banking institution may calculate a multi-year cumulative PD and then annualise the resulting figure. Where intra-year rating migrations contain additional information, these migrations could be analysed as separate rating movements in order to infer PDs, which may be especially useful for the higher-quality rating grades.

vi) If low default rates in a particular portfolio are the result of credit support, the lowest non-default rating could be used as a proxy for default (e.g. banks, investment firms, thrifts, pension funds,

insurance firms) in order to develop ratings that differentiate risks. When such an approach is taken, calibration of such ratings to a PD consistent with IRB definition of default would still be necessary.

3. While banking institutions would not be expected to utilise all of these tools, the suitability and most appropriate combination of individual tools and techniques will depend on the nature of the banking institution and the characteristics of the specific portfolio.

Benchmarking tools for validation

4. In addition, where a scarcity of internal historical data makes it difficult to meaningfully back-test risk rating predictions against realised defaults, it may be possible to make greater use of various benchmarking tools for validation. Among the tools that could potentially be used are the following:

   i) Internal ratings and migration matrices could be compared with the ratings and migrations of third parties such as rating agencies or data pools, or with the ratings and migrations resulting from other internal models.

   ii) Internal ratings could be benchmarked against internal or external expert judgements, for example where a portfolio has not experienced recent losses but where historical experience suggests the risk of loss is greater than zero.

   iii) Internal ratings could be compared with market-based proxies for credit quality, such as equity prices, bond spreads, or premiums for credit derivatives.

   iv) An analysis of the rating characteristics of similarly rated exposures could be undertaken.

v) The average rating output for the portfolio as a whole could be compared with actual experience for the portfolio rather than focusing on back-testing estimates for more narrowly defined segments of the portfolio. Similarly, rating grades can be combined in order to make back-testing more meaningful.

5. This list is not intended to be exhaustive, but rather serve as a useful guide of some benchmarking tools that might be useful in the case of scarce internal loss data. It is important that banking institutions utilise as many tools and techniques, as necessary to build confidence and demonstrate the predictive ability of the credit risk rating systems.

Appendix XXX Illustration on the Treatment of Underwriting Exposures

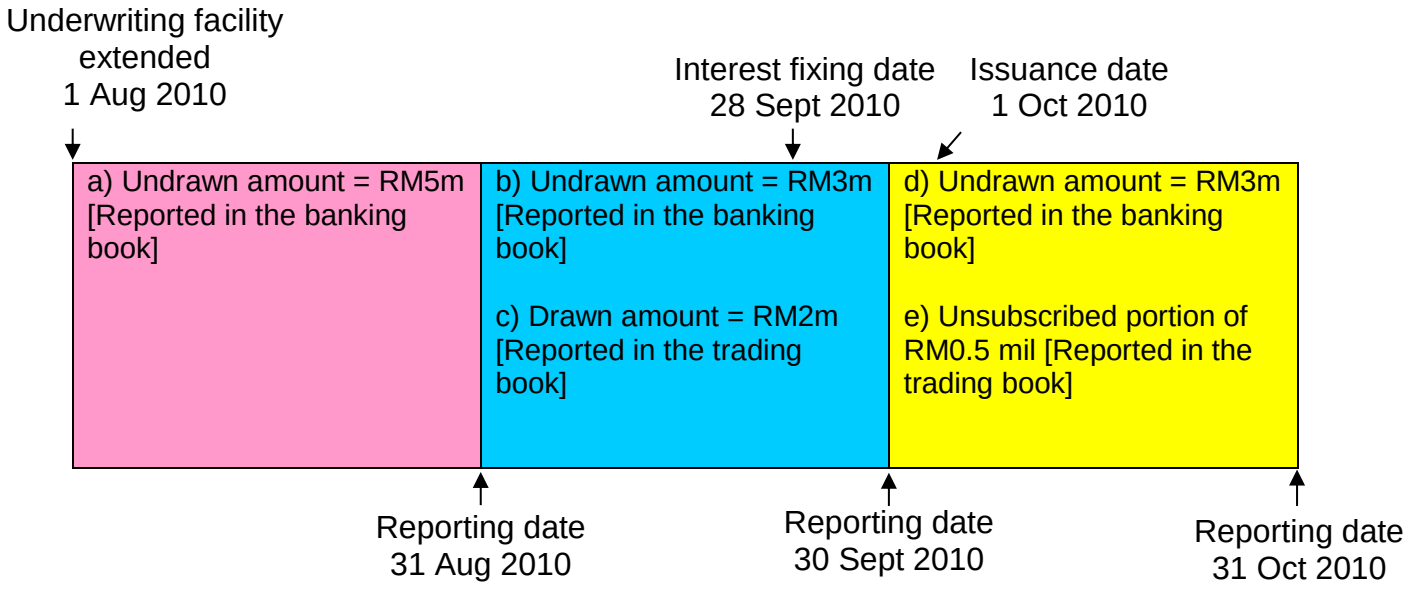
Example

Bank A (applying the Standardised Approach for Credit Risk) extends a 5-year underwriting Commercial Paper (CP) facility of RM5 million to Company ABC on 1 September 2010. On 28 September 2010, Company ABC decides to utilise the facility with a CP issuance of RM2 million.

Nominal amount of CP underwriting facility granted	RM5 million
Nominal amount of underwriting (drawn portion)	RM2 million
Rating and tenor	P1 rated CP, 3 months tenor
Date of fixing the rate (drawn portion)	28 September 2010
Date of issuance	1 October 2010

On 1 October 2010, the CP was issued where:

- RM1.5 million was subscribed; and
- RM0.5 million was unsubscribed, hence remained with Bank A.



At the reporting date 31 August 2010, where it falls between the interest fixing date and issue date:

a) The undrawn amount is deemed as a banking book position and is subject to the credit risk capital charge

RM5m x 50% x 8%

At the reporting date 30 September 2010, where it falls between the interest fixing date and issue date:

b) The undrawn amount is deemed as a banking book position and is subject to the credit risk capital charge

RM3m x 50% x 8%

c) The drawn amount is deemed as a trading book position and is subject to the market risk capital charge based on the maturity and rating of the CP issued:

The general risk: RM2m x 50% x 0.2%

The specific risk: RM2m x 50% x 0.25%

At the reporting date 31 October 2010, where the CP has been issued and Bank A holds RM0.5m of the unsubscribed portion:

d) The undrawn amount is deemed as a banking book position and is subject to the credit risk capital charge

RM3 mil x 50% x 8%

e) The unsubscribed portion is deemed as a trading book position (with intention to sell down) and is subject to the market risk capital charge based on the maturity and rating of the CP purchased:

The general risk: RM0.5m x 0.2%

The specific risk: RM0.5m x 0.25%

Appendix XXXI Capital Treatment for Credit Derivatives in the Trading Book

The following table summarises the capital treatment for credit derivatives in the trading book[318]:

Transaction	Risk Type	Protection seller	Protection buyer
Credit Default Swaps	**General market risk**	A long position in each premium or interest payment (each payment is treated as a zero coupon risk-free position) when there are any periodic premiums or interest payments to be received.	A short position in each premium or interest payment (each payment is treated as a zero coupon risk-free position) when there are any periodic premiums or interest payments to be paid.
	Specific risk	A position in the reference asset based on the notional amount with a maturity equal to the expiry date of the swap.	A position in the reference asset based on the notional amount with a maturity equal to the expiry date of the swap. An offset on the specific risk of the reference asset is allowed as prescribed in paragraphs 5.55 to 5.57.
First-to-Default	**General market risk**	A long position in each premium or interest payment (each payment is treated as a zero coupon risk-free position) when there are any periodic premiums or interest payments to be received.	A short position in each premium or interest payment (each payment is treated as a zero coupon risk-free position) when there are any periodic premiums or interest payments to be paid.
	Specific risk	A position in all the reference assets in the basket based on the notional amount with a maturity equal to the expiry date of the protection[319].	A position in all the reference assets based on the notional amount with a maturity equal to the expiry date of the protection.

[318] For the avoidance of doubt, banking institutions must also compute counterparty credit risk for these transactions.

[319] If the credit protection product has an external credit assessment from an eligible ECAI, the risk weight as specified for securitisation in Part F will be applied. If the product is not rated by

Transaction	Risk Type	Protection seller	Protection buyer
		The total specific risk capital requirement is capped at the maximum payout possible under the derivative contract.	An offset on the specific risk of the reference asset with the lowest specific risk charge is allowed as prescribed in paragraphs 5.55 to 5.57.
Second-to-Default	**General market risk**	A long position in each premium or interest payment (each payment is treated as a zero coupon risk-free position) when there are any periodic premiums or interest payments to be received.	A short position in each premium or interest payment (each payment is treated as a zero coupon risk-free position) when there are any periodic premiums or interest payments to be paid.
	Specific risk	A position in all the reference assets in the basket based on the notional amount with a maturity equal to the expiry date of the protection[319], except for the asset with the lowest specific risk charge, which can be excluded from the computation. The total specific risk capital requirement is capped at the maximum payout possible under the derivative contract.	A position in all the reference assets based on the notional amount with a maturity equal to the expiry date of the protection. An offset on the specific risk of the reference asset with the second lowest specific risk charge is allowed as prescribed in paragraphs 5.55 to 5.57. However, this is only recognised when first-to-default protection has also been obtained or when one of the assets within the basket has already defaulted.
Credit Linked Notes	**General market risk**	A long position in the note issued based on the notional amount with a maturity equal to the expiry date of the note or the date which the interest	A short position in the note issued based on the notional amount with a maturity equal to the expiry date of the note or the date which the interest

an eligible ECAI, the risk weights of the assets included in the basket will be as prescribed in Appendix III.

Transaction	Risk Type	Protection seller	Protection buyer
		rate will be reset.	rate will be reset.
	Specific risk	A position in the reference asset based on the notional amount with a maturity equal to the expiry date of the note. Also, a position in the note issued based on the notional amount with a maturity equals to the expiry date of the note or the date which the interest rate will be reset.	A position in the reference asset based on the notional amount with a maturity equal to expiry date of the note. An offset on the specific risk of the reference asset is allowed as prescribed in paragraphs 5.55 to 5.57.
Total Return Swaps	**General market risk**	A long position in the reference asset based on the notional amount with a maturity equal to the expiry date of the swap. Also, a short position in each premium or interest payment (each payment is treated as a zero coupon risk-free position) when there are any periodic premiums or interest payments to be paid.	A short position in the reference asset based on the notional amount with a maturity equal to the expiry date of the swap. Also, a long position in each premium or interest payment (each payment is treated as a zero coupon risk-free position) when there are any periodic premiums or interest payments to be received.
	Specific risk[320]	A position in the reference asset based on the notional amount with a maturity equal to the expiry date of the swap.	A position in the reference asset based on the notional amount with a maturity equal to the expiry date of the swap. An offset on the specific risk of the reference asset is allowed as prescribed in paragraphs 5.55 to 5.57.

[320] The long or short position is based on the reference asset if cash settled, or based on the deliverable asset if physical delivery.