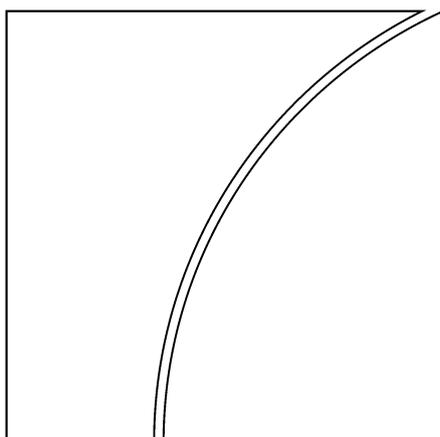


Basel Committee
on Banking Supervision



**Quantitative Impact
Study 3
Technical Guidance**

October 2002



BANK FOR INTERNATIONAL SETTLEMENTS

Table of Contents

Part 1: Scope of Application	1
A. Introduction	1
B. Banking, securities and other financial subsidiaries.....	1
C. Significant minority investments in banking, securities and other financial entities	2
D. Insurance entities.....	3
E. Significant investments in commercial entities.....	4
F. Deduction of investments pursuant to this part.....	4
Part 2: The first Pillar - Minimum Capital requirements.....	6
I. Calculation of minimum capital requirements	6
II. Credit risk – The standardised approach.....	6
A. The standardised approach – general rules	6
1. Individual claims	7
(i) Claims on sovereigns.....	7
(ii) Claims on non-central government public sector entities (PSEs)	8
(iii) Claims on multilateral development banks (MDBs).....	8
(iv) Claims on banks	9
(v) Claims on securities firms	10
(vi) Claims on corporates.....	10
(vii) Claims included in the regulatory retail portfolios	11
(viii) Claims secured by residential property	11
(ix) Claims secured by commercial real estate.....	11
(x) Higher-risk categories	12
(xi) Other assets	12
(xii) Off-balance sheet items	12
2. External credit assessments	13
(i) The recognition process.....	13
(ii) Eligibility criteria.....	13
3. Implementation considerations	14
(i) The mapping process	14
(ii) Multiple assessments.....	14
(iii) Issuer versus issues assessment	14
(iv) Domestic currency and foreign currency assessments	15
(v) Short term/long term assessments.....	15
(vi) Level of application of the assessment	16

(vii) Unsolicited ratings.....	16
B. The standardised approach - Credit risk mitigation.....	17
1. Overarching issues	17
(i) Introduction	17
(ii) General Remarks.....	17
(iii) Legal Certainty.....	17
2. Overview of Credit Risk Mitigation Techniques	18
(i) Collateralised transactions	18
(ii) On-balance sheet netting	20
(iii) Guarantees and credit derivatives.....	20
(iv) Maturity mismatch.....	21
(v) Miscellaneous	21
3. Collateral.....	21
(i) Eligible Collateral	21
(ii) The comprehensive approach.....	22
(iii) The simple approach	30
(iv) Collateralised OTC derivatives transactions.....	31
4. On-balance sheet netting	31
5. Guarantees and credit derivatives.....	32
(i) Operational requirements.....	32
(ii) Range of eligible guarantors/protection providers	34
(iii) Risk weights.....	34
(iv) Currency mismatches	35
(v) Sovereign guarantees	35
6. Maturity mismatches	35
(i) Definition of maturity	35
(ii) Risk weights for maturity mismatches	36
7. Other items related to the treatment of CRM techniques.....	36
(i) Treatment of pools of CRM techniques	36
(ii) First-to-default credit derivatives	36
(iii) Second-to-default credit derivatives	37
III. Credit Risk - The Internal Ratings Based Approach	37
A. Overview.....	37
B. Mechanics of the IRB Approach.....	37
1. Categorisation of exposures.....	38
(i) Definition of corporate exposures.....	38
(ii) Definition of sovereign exposures	40

(iii)	Definition of bank exposures	40
(iv)	Definition of retail exposures	40
(v)	Qualifying revolving exposures	41
(vi)	Definition of equity exposures	42
(vii)	Definition of eligible purchased receivables	44
2.	Foundation and advanced approaches	45
(i)	Corporate, sovereign, and bank exposures.....	45
(ii)	Retail exposures	46
(iii)	Equity exposures	46
(iv)	Eligible purchased receivables.....	46
3.	Adoption of the IRB approach across all asset classes	46
4.	Transition arrangements	47
(i)	Parallel calculation for banks adopting the advanced approach	47
(ii)	Corporate, sovereign, bank, and retail exposures	47
(iii)	Equity exposures	48
C.	Rules for Corporate, Sovereign, and Bank Exposures	48
1.	Risk-weighted assets for corporate, sovereign, and bank exposures	48
(i)	Formula for derivation of risk weights.....	48
(ii)	Firm-size adjustment for small- and medium-sized entities (SME) ...	49
(iii)	Risk weights for specialised lending.....	49
2.	Risk Components	50
(i)	Probability of Default (PD)	50
(ii)	Loss Given Default (LGD).....	50
(iii)	Exposure at Default (EAD).....	55
(iv)	Effective Maturity (M).....	56
D.	Rules for Retail Exposures.....	58
1.	Risk-weighted assets for retail exposures	58
(i)	Residential mortgage exposures.....	58
(ii)	Qualifying revolving exposures	58
(iii)	Other retail exposures.....	59
2.	Risk components	59
(i)	Probability of default (PD) and loss given default (LGD)	59
(iii)	Exposure at default (EAD)	59
E.	Rules for Equity Exposures	60
1.	Risk weighted assets for equity exposures	60
(i)	Market-based approach.....	60
(ii)	PD/LGD approach	61

(iii)	Exclusions to the market-based and PD/LGD approaches.....	62
2.	Risk components	63
F.	Rules for Purchased Receivables	63
1.	Risk-weighted assets for default risk.....	63
(i)	Purchased retail receivables	63
(ii)	Purchased corporate receivables.....	64
2.	Risk-weighted assets for dilution risk	65
(i)	Treatment of purchase discounts	65
(ii)	Recognition of guarantees	65
G.	Recognition of Provisions.....	66
H.	Minimum Requirements for IRB Approach	67
1.	Composition of minimum requirements	67
2.	Compliance with minimum requirements.....	67
3.	Rating system design.....	68
(i)	Rating dimensions	68
(ii)	Rating structure	69
(iii)	Rating criteria.....	70
(iv)	Assessment horizon.....	71
(v)	Use of models.....	71
(vi)	Documentation of rating system design	72
4.	Risk rating system operations	73
(i)	Coverage of ratings.....	73
(ii)	Integrity of rating process.....	73
(iii)	Overrides	73
(iv)	Data maintenance.....	74
(v)	Stress tests used in assessment of capital adequacy	74
5.	Corporate governance and oversight	75
(i)	Corporate governance	75
(ii)	Credit risk control.....	76
(iii)	Internal and external audit.....	76
6.	Use of internal ratings	76
7.	Risk quantification.....	77
(i)	Overall requirements for estimation	77
(ii)	Definition of default	78
(iii)	Reaging	79
(iv)	Treatment of overdrafts.....	79
(v)	Definition of loss - all asset classes.....	79

(vi)	Requirements specific to PD estimation.....	80
(vii)	Requirements specific to own-LGD estimates.....	81
(viii)	Requirements specific to own-EAD estimates.....	82
(ix)	Minimum requirements for assessing effect of guarantees and credit derivatives	83
(x)	Requirements specific to estimating PD and LGD (or EL) for qualifying purchased receivables	85
8.	Validation of internal estimates	87
9.	Supervisory LGD and EAD estimates	88
(i)	Definition of eligible commercial real estate (CRE) and residential real estate (RRE) collateral.....	88
(ii)	Operational requirements for CRE/RRE	88
(iii)	Requirements for recognition of financial receivables	89
10.	Calculation of capital charges for equity exposures.....	92
(i)	The internal models market-based approach	92
(ii)	Capital charge and risk quantification	92
(iii)	Risk management process and controls	94
(iv)	Validation and documentation.....	95
11.	Disclosure requirements	97
IV.	Credit Risk – Securitisation Framework.....	97
A.	Scope and definitions of transactions covered under the securitisation framework.....	97
B.	Definitions.....	97
1.	Types of securitisations	97
(i)	Traditional securitisations	97
(ii)	Synthetic securitisations	97
(iii)	Securitisation of revolving assets.....	98
2.	Different roles played by banks.....	98
(i)	Investing bank	98
(ii)	Originating bank.....	98
(iii)	Servicer bank.....	98
3.	General terminology.....	98
(i)	Clean-up call.....	98
(ii)	Credit enhancement	98
(iii)	Early amortisation	99
(iv)	Excess spread	99
(v)	Implicit support.....	99
(vi)	Special purpose entity (SPE)	99
C.	Operational criteria for the recognition of risk transference	100

1.	Operational criteria for traditional securitisations	100
2.	Operational criteria for use of synthetic securitisations	100
3.	Operational requirements and treatment of clean-up calls	101
	(i) Clean-up calls for traditional securitisations	101
	(ii) Clean-up calls for synthetic securitisations.....	102
D.	Treatment of Securitisation Exposures.....	102
1.	Minimum Capital Requirement.....	102
	(i) Deduction	102
	(ii) Implicit Support	102
2.	Operational Criteria for Use of External Credit Assessments	102
3.	Standardised Approach for Securitisation Exposures.....	103
	(i) Scope	103
	(ii) Risk Weights.....	103
	(iii) Exceptions to General Treatment of Unrated Securitisation Exposures	104
	(iv) Credit Conversion Factors for Off-balance Sheet Exposures	105
	(v) Recognition of Credit Risk Mitigants	106
	(vi) Capital Requirement for Early Amortisation Provisions	107
	(vii) Controlled Early Amortisation Features.....	108
	(viii) Non-controlled Early Amortisation Features.....	109
4.	Internal Ratings-Based Approach for Securitisations	110
	(i) Scope	110
	(ii) Hierarchy of Approaches.....	110
	(iii) Maximum Capital Requirement.....	111
	(iv) Rating Based Approach (RBA)	111
	(v) Supervisory Formula Approach (SFA).....	113
V.	Operational risk.....	116
A.	Definition of operational risk.....	116
B.	The measurement methodologies	116
	1. The Basic Indicator Approach	117
	2. The Standardised Approach	117
	3. Advanced Measurement Approaches	118
C.	Qualifying criteria	119
	1. General criteria	119
	2. The Standardised Approach	119
D.	Advanced Measurement Approaches.....	120
	1. Qualitative Standards.....	120
	2. Quantitative Standards.....	121

(i)	AMA Soundness Standard.....	121
(ii)	Detailed criteria.....	122
(iii)	Internal data.....	122
(iv)	External data	123
(v)	Scenario analysis.....	123
(vi)	Business environment and internal control factors	124
(vii)	Risk mitigation	124
VI.	Trading book issues	125
A.	Definition of the trading book.....	125
B.	Prudent valuation guidance.....	126
1.	Systems and controls.....	126
2.	Valuation methodologies.....	127
(i)	Marking to market.....	127
(ii)	Marking to model	127
(iii)	Independent price verification	128
3.	Valuation adjustments or reserves	128
C.	Treatment of Credit Risk Mitigation in the Trading Book.....	128
D.	Trading book capital treatment for specific risk under the standardised methodology	129
1.	Specific risk capital charges for government paper	129
2.	Specific risk rules for unrated debt securities	130
3.	Specific risk capital charges for positions hedged by credit derivatives ...	130
4.	Add-on factor for credit derivatives.....	131
	Annex 1: Evaluating CDRs: two proposed measures	134
	Annex 2: Mapping risk ratings to risk weights using CDRs	135
	Annex 3: Illustrative IRB Risk Weights	139
	Annex 4: Supervisory Slotting Criteria for Specialised Lending	141
	Annex 5: Principles for business line mapping	160
	Annex 6: Standardised and Foundation IRB Approaches.....	163
	Annex 7: Special Considerations for Repo-Style Transactions	164

Quantitative Impact Study 3

Technical Guidance

Part 1: Scope of Application

A. Introduction

1. The New Basel Capital Accord (the New Accord) will be applied on a consolidated basis to internationally active banks. This is the best means to preserve the integrity of capital in banks with subsidiaries by eliminating double gearing.
2. The scope of application of the Accord will be extended to include, on a fully consolidated basis, any holding company that is the parent entity within a banking group to ensure that it captures the risk of the whole banking group.¹ Banking groups are groups that engage predominantly in banking activities and, in some countries, a banking group may be registered as a bank.
3. The Accord will also apply to all internationally active banks at every tier within a banking group, also on a fully consolidated basis (see illustrative chart at the end of this section).² A three-year transitional period for applying full sub-consolidation will be provided for those countries where this is not currently a requirement.
4. Further, as one of the principal objectives of supervision is the protection of depositors, it is essential to ensure that capital recognised in capital adequacy measures is readily available for those depositors. Accordingly, supervisors should test that individual banks are adequately capitalised on a stand-alone basis.

B. Banking, securities and other financial subsidiaries

5. To the greatest extent possible, all banking and other relevant financial activities³ (both regulated and unregulated) conducted within a group containing an internationally active bank will be captured through consolidation. Thus, majority-owned or-controlled banking entities, securities entities (where subject to broadly similar regulation or where

¹ A holding company that is a parent of a banking group may itself have a parent holding company. In some structures, this parent holding company may not be subject to this Accord because it is not considered a parent of a banking group.

² As an alternative to full sub-consolidation, the application of the Accord to the stand-alone bank (i.e. on a basis that does not consolidate assets and liabilities of subsidiaries) would achieve the same objective, providing the full book value of any investments in subsidiaries and significant minority-owned stakes is deducted from the bank's capital.

³ In Part 1, "financial activities" do not include insurance activities and "financial entities" do not include insurance entities.

securities activities are deemed banking activities) and other financial entities⁴ should generally be fully consolidated.

6. Supervisors will assess the appropriateness of recognising in consolidated capital the minority interests that arise from the consolidation of less than wholly owned banking, securities or other financial entities. Supervisors will adjust the amount of such minority interests that may be included in capital in the event the capital from such minority interests is not readily available to other group entities.

7. There may be instances where it is not feasible or desirable to consolidate certain securities or other regulated financial entities. This would be only in cases where such holdings are acquired through debt previously contracted and held on a temporary basis, are subject to different regulation, or where non-consolidation for regulatory capital purposes is otherwise required by law. In such cases, it is imperative for the bank supervisor to obtain sufficient information from supervisors responsible for such entities.

8. If any majority-owned securities and other financial subsidiaries are not consolidated for capital purposes, all equity and other regulatory capital investments in those entities attributable to the group will be deducted, and the assets and liabilities, as well as third-party capital investments in the subsidiary will be removed from the bank's balance sheet. Supervisors will ensure that the entity that is not consolidated and for which the capital investment is deducted meets regulatory capital requirements. Supervisors will monitor actions taken by the subsidiary to correct any capital shortfall and, if it is not corrected in a timely manner, the shortfall will also be deducted from the parent bank's capital.

C. Significant minority investments in banking, securities and other financial entities

9. Significant minority investments in banks, securities and other financial entities, where control does not exist, will be excluded from the banking group's capital by deduction of the equity and other regulatory investments. Alternatively, such investments might be, under certain conditions, consolidated on a pro rata basis. For example, pro rata consolidation may be appropriate for joint ventures or where the supervisor is satisfied that the parent is legally or de facto expected to support the entity on a proportionate basis only and the other significant shareholders have the means and the willingness to proportionately support it. The threshold above which minority investments will be deemed significant and be thus either deducted or consolidated on a pro-rata basis is to be determined by national accounting and/or regulatory practices. As an example, the threshold for pro-rata inclusion in the European Union is defined as equity interests of between 20% and 50%.

10. The Committee reaffirms the view set out in the 1988 Accord that reciprocal cross-holdings of bank capital artificially designed to inflate the capital position of banks will be deducted for capital adequacy purposes.

⁴ Examples of the types of activities that financial entities might be involved in include financial leasing, issuing credit cards, portfolio management, investment advisory, custodial and safekeeping services and other similar activities that are ancillary to the business of banking.

D. Insurance entities

11. A bank that owns an insurance subsidiary bears the full entrepreneurial risks of the subsidiary and should recognise on a group-wide basis the risks included in the whole group. When measuring regulatory capital for banks, the Committee believes that at this stage it is, in principle, appropriate to deduct banks' equity and other regulatory capital investments in insurance subsidiaries and also significant minority investments in insurance entities. Under this approach the bank would remove from its balance sheet assets and liabilities, as well as third party capital investments in an insurance subsidiary. Alternative approaches that can be applied should, in any case, include a group-wide perspective for determining capital adequacy and avoid double counting of capital.

12. Due to issues of competitive equality, some G10 countries will retain their existing risk weighting treatment⁵ as an exception to the approaches described above and introduce risk aggregation only on a consistent basis to that applied domestically by insurance supervisors for insurance firms with banking subsidiaries.⁶ The Committee invites insurance supervisors to develop further and adopt approaches that comply with the above standards.

13. Banks should disclose the national regulatory approach used with respect to insurance entities in determining their reported capital positions.

14. The capital invested in a majority-owned or controlled insurance entity may exceed the amount of regulatory capital required for such entity (surplus capital). Supervisors may permit the recognition of such surplus capital in calculating a bank's capital adequacy, under limited circumstances.⁷ National regulatory practices will determine the parameters and criteria, such as legal transferability, for assessing the amount and availability of surplus capital that could be recognised in bank capital. Other examples of availability criteria include: restrictions on transferability due to regulatory constraints, to tax implications and to adverse impacts on external credit assessment institutions' ratings. Banks recognising surplus capital in insurance subsidiaries will publicly disclose the amount of such surplus capital recognised in their capital. Where a bank does not have a full ownership interest in an insurance entity (e.g. 50% or more but less than 100% interest), surplus capital recognised should be proportionate to the percentage interest held. Surplus capital in significant minority-owned insurance entities will not be recognised, as the bank would not be in a position to direct the transfer of the capital in an entity which it does not control.

15. Supervisors will ensure that majority-owned or controlled insurance subsidiaries, which are not consolidated and for which capital investments are deducted or subject to an alternative group-wide approach, are themselves adequately capitalised to reduce the possibility of future potential losses to the bank. Supervisors will monitor actions taken by the

⁵ For banks using the standardised approach this would mean applying no less than a 100% risk weight, while for banks on the IRB approach, the appropriate risk weight based on the IRB rules shall apply to such investments.

⁶ Where the existing treatment is retained, third party capital invested in the insurance subsidiary (i.e. minority interests) cannot be included in the bank's capital adequacy measurement.

⁷ In a deduction approach, the amount deducted for all equity and other regulatory capital investments will be adjusted to reflect the amount of capital in those entities that is in surplus to regulatory requirements, i.e. the amount deducted would be the lesser of the investment or the regulatory capital requirement. The amount representing the surplus capital, i.e. the difference between the amount of the investment in those entities and their regulatory capital requirement, would be risk-weighted as an equity investment. If using an alternative group-wide approach, an equivalent treatment of surplus capital will be made.

subsidiary to correct any capital shortfall and, if it is not corrected in a timely manner, the shortfall will also be deducted from the parent bank's capital.

E. Significant investments in commercial entities

16. Significant minority and majority investments in commercial entities which exceed certain materiality levels will be deducted from banks' capital. Materiality levels will be determined by national accounting and/or regulatory practices. Materiality levels of 15% of the bank's capital for individual significant investments in commercial entities and 60% of the bank's capital for the aggregate of such investments, or stricter levels, will be applied. The amount to be deducted will be that portion of the investment that exceeds the materiality level.

17. Investments in significant minority- and majority-owned and controlled commercial entities below the materiality levels noted above will be risk weighted at no lower than 100% for banks using the standardised approach. For banks using the IRB approach, the investment would be risk weighted in accordance with the methodology the Committee is developing for equities and would not be less than 100%.

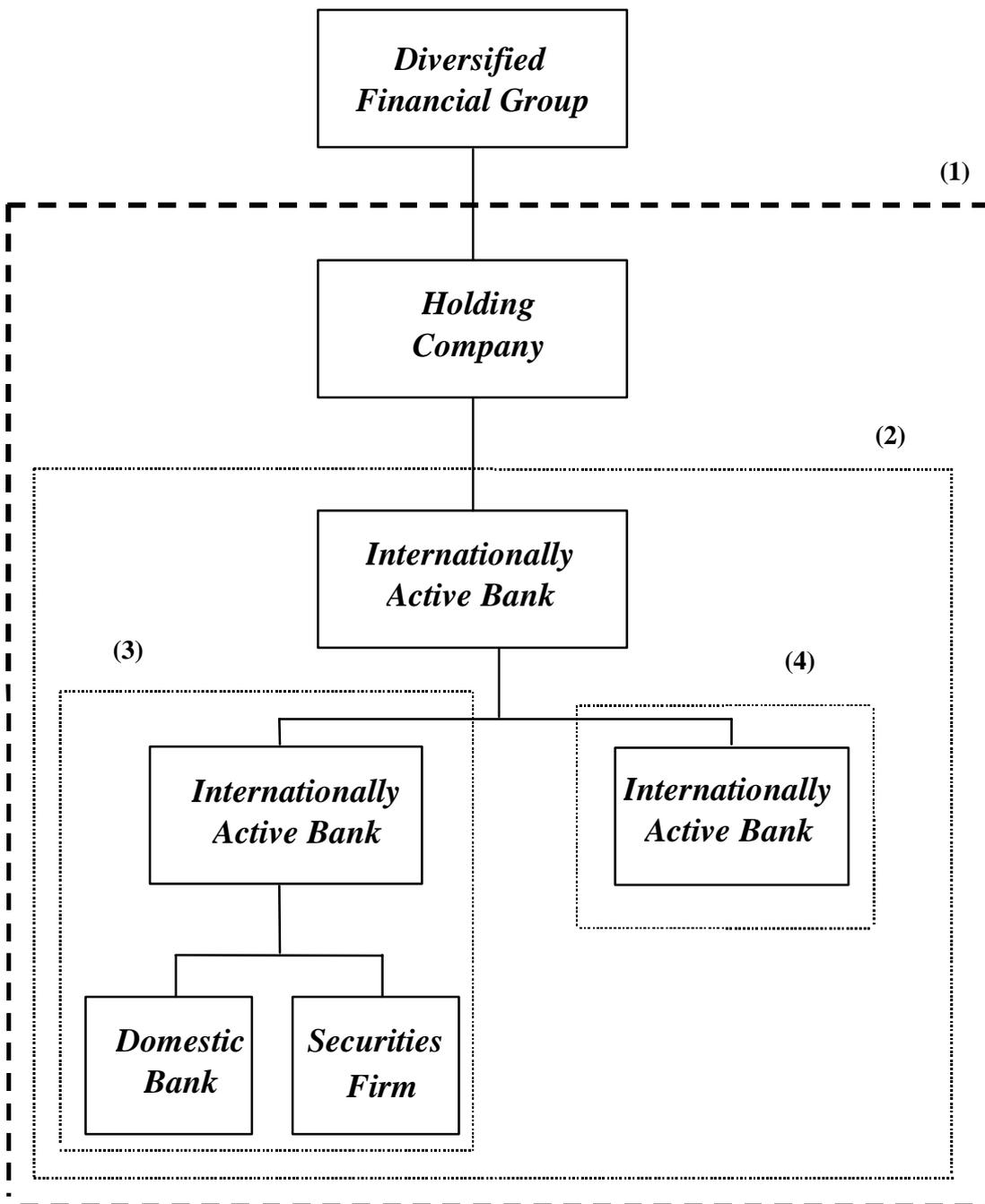
F. Deduction of investments pursuant to this part

18. Where deductions of investments are made pursuant to this part on scope of application, the deductions will be 50% from Tier 1 and 50% from Tier 2.

19. Goodwill relating to entities subject to a deduction approach pursuant to this part should be deducted from tier 1 in the same manner as goodwill relating to consolidated subsidiaries, and the remainder of the investments should be deducted as provided for in this part. A similar treatment of goodwill should be applied, if using an alternative group-wide approach pursuant to paragraph 11.

20. The issuance of the final Accord will clarify that the limits on tier 2 and tier 3 capital and on innovative tier 1 instruments will be based on the amount of tier 1 capital after deduction of goodwill but before the deductions of investments pursuant to this part on scope of application (see Annex 1 for an example how to calculate the 15% limit for innovative tier 1 instruments).

ILLUSTRATION OF NEW SCOPE OF APPLICATION OF THE ACCORD



(1) Boundary of predominantly banking group. The Accord is to be applied at this level on a consolidated basis, i.e. up to holding company level (cf. Paragraph 2 of this section).

(2), (3) and (4): the Accord is also to be applied at lower levels to all internationally active banks on a consolidated basis.

Part 2: The first Pillar - Minimum Capital Requirements

I. Calculation of minimum capital requirements

21. This section discusses the calculation of the total minimum capital requirements for credit, market and operational risk. The minimum capital requirements are composed of three fundamental elements; a definition of regulatory capital, risk weighted assets and the minimum ratio of capital to risk weighted assets.

22. In calculating the capital ratio, the denominator or total risk weighted assets will be determined by multiplying the capital requirements for market risks and operational risk by 12.5 (i.e. the reciprocal of the minimum capital ratio of 8%) and adding the resulting figures to the sum of risk-weighted assets compiled for credit risk. The ratio will be calculated in relation to the denominator, using regulatory capital as the numerator. The definition of eligible regulatory capital will remain the same as outlined in the 1988 Accord and clarified in the 27 October 1998 press release on "Instruments eligible for inclusion in Tier 1 capital". The ratio must be no lower than 8% for total capital. Tier 2 capital will continue to be limited to 100% of Tier 1 capital.

23. For banks using either one of the Internal Ratings-based (IRB) Approaches for credit risk or the Advanced Measurement Approaches (AMA) for operational risk, there will be a single capital floor for the first two years following implementation of the new Accord. This floor will be based on calculations using the rules of the existing Accord. Beginning year-end 2006 and during the first year following implementation, IRB capital requirements for credit risk together with operational risk capital charges cannot fall below 90% of the current minimum required, and in the second year, the minimum will be 80% of this level. Should problems emerge during this period, the Committee will seek to take appropriate measures to address them, and, in particular, will be prepared to keep the floor in place beyond 2008 if necessary.

II. Credit risk – The standardised approach

24. The Committee proposes to permit banks a choice between two broad methodologies for calculating their capital requirements for credit risk. One alternative will be to measure credit risk in a standardised manner, supported by external credit assessments.⁸

25. The alternative methodology, which is subject to the explicit approval of the bank's supervisor, would allow banks to use their internal rating systems.

A. The standardised approach – general rules

26. The following section sets out revisions to the 1988 Accord for risk weighting banking book exposures. Exposures that are not explicitly addressed in this section will

⁸ The notations follow the methodology used by one institution, Standard & Poor's. The use of Standard & Poor's credit ratings is an example only; those of some other external credit assessment agencies could equally well be used. The ratings used throughout this document, therefore, do not express any preferences or determinations on external assessment institutions by the Committee.

retain the current treatment; however, credit risk mitigation techniques and exposures related to asset securitisation are dealt with in the subsequent sections. In determining the risk weights in the standardised approach, banks may use assessments by external credit assessment institutions recognised as eligible for capital purposes by national supervisors in accordance with the criteria defined in paragraphs 52-53.

1. Individual claims

(i) Claims on sovereigns

27. Claims on sovereigns and their central banks will be risk weighted as follows:

Credit Assessment	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
Risk Weight	0%	20%	50%	100%	150%	100%

28. At national discretion, a lower risk weight may be applied to banks’ exposures to their sovereign (or central bank) of incorporation denominated in domestic currency and funded⁹ in that currency.¹⁰ Where this discretion is exercised, other national supervisory authorities may also permit their banks to apply the same risk weight to domestic currency exposures to this sovereign (or central bank) funded in that currency.

29. For the purpose of risk weighting claims on sovereigns, supervisors may recognise the country risk scores assigned by Export Credit Agencies (“ECAs”). To qualify, an ECA must publish its risk scores and subscribe to the OECD agreed methodology. Banks may choose to use the risk scores published by those ECAs that are recognised by their supervisor. The OECD agreed methodology establishes seven risk score categories associated with minimum export insurance premiums. These ECA risk scores will correspond to risk weight categories as detailed below (see paragraphs 58 to 60 for the treatment of multiple assessments). Where a risk score is not associated with a minimum premium, it will not be recognised for risk weighting purposes.

ECA risk scores	1	2	3	4 to 6	7
Risk weight	0%	20%	50%	100%	150%

30. Claims on the Bank for International Settlements, the International Monetary Fund, the European Central Bank and the European Community may receive a 0% risk weight.

⁹ This is to say that the bank would also have corresponding liabilities denominated in the domestic currency.
¹⁰ This lower risk weight may be extended to the risk weighting of collateral and guarantees. See sections B-2 and B-4.

(ii) *Claims on non-central government public sector entities (PSEs)*

31. Claims on domestic PSEs will be risk-weighted at national discretion, according to either option 1 or option 2 for claims on banks.¹¹ When option 2 is selected, it is to be applied without the use of the preferential treatment for short-term claims.

32. Subject to national discretion, claims on certain domestic PSEs may also be treated as claims on the sovereigns in whose jurisdictions the PSEs are established.¹² Where this discretion is exercised, other national supervisors may allow their banks to risk weight claims on such PSEs in the same manner.

(iii) *Claims on multilateral development banks (MDBs)*

33. The risk weights applied to claims on MDBs will generally be based on external credit assessments as set out under option 2 for claims on banks but without the possibility of using the preferential treatment for short-term claims. A 0% risk weight will be applied to claims on highly rated MDBs that fulfil to the Committee's satisfaction the criteria provided below.¹³ The Committee will continue to evaluate eligibility on a case-by-case basis. The eligibility criteria for MDBs risk weighted at 0% are:

- very high quality long-term issuer ratings, i.e. a majority of an MDB's external assessments must be AAA;
- shareholder structure is comprised of a significant proportion of sovereigns with long term issuer credit assessments of AA- or better;
- strong shareholder support demonstrated by the amount of paid-in capital contributed by the shareholders; the amount of further capital the MDBs have the

¹¹ This is regardless of the option chosen at national discretion for claims on banks of that country. It therefore does not imply that when one option has been chosen for claims on banks, the same option should also be applied to claims on PSEs.

¹² The following examples outline how PSEs might be categorised when focusing on one specific feature, namely revenue raising powers. However, there may be other ways of determining the different treatments applicable to different types of PSEs, for instance by focusing on the extent of guarantees provided by the central government:

- **Regional governments and local authorities** could qualify for the same treatment as claims on their sovereign or central government if these governments and local authorities have specific revenue-raising powers and have specific institutional arrangements the effect of which is to reduce their risks of default.
- **Administrative bodies responsible to central governments, regional governments or to local authorities and other non-commercial undertakings** owned by the governments or local authorities may not warrant the same treatment as claims on their sovereign if the entities do not have revenue raising powers or other arrangements as described above. If strict lending rules apply to these entities and a declaration of bankruptcy is not possible because of their special public status, it may be appropriate to treat these claims in the same manner as claims on banks.
- **Commercial undertakings** owned by central governments, regional governments or by local authorities may however be treated as normal commercial enterprises. However, if these entities function as a corporate in competitive markets even though the state, a regional authority or a local authority is the major shareholder of these entities, supervisors should decide to consider them as corporates and therefore attach to them the applicable risk weights.

¹³ MDBs currently eligible for a 0% risk weight are: the World Bank Group comprised of the International Bank for Reconstruction and Development (IBRD) and the International Finance Corporation (IFC), the Asian Development Bank (ADB), the African Development Bank (AfDB), the European Bank for Reconstruction and Development (EBRD), the Inter-American Development Bank (IADB), the European Investment Bank (EIB), the Nordic Investment Bank (NIB), the Caribbean Development Bank (CDB), and the Council of Europe Development Bank (CEDB).

right to call, if required, to repay their liabilities; and continued capital contributions and new pledges from sovereign shareholders;

- adequate level of capital and liquidity (a case-by-case approach is necessary in order to assess whether each institution’s capital and liquidity are adequate); and,
- strict statutory lending requirements and conservative financial policies, which would include among other conditions a structured approval process, internal creditworthiness and risk concentration limits (per country, sector, and individual exposure and credit category), large exposures approval by the board or a committee of the board, fixed repayment schedules, effective monitoring of use of proceeds, status review process, and rigorous assessment of risk and provisioning to loan loss reserve.

(iv) *Claims on banks*

34. There are two options for claims on banks. National supervisors will apply one option to all banks in their jurisdiction. No claim on an unrated bank may receive a risk weight less than that applied to claims on its sovereign of incorporation.

35. Under the first option, all banks incorporated in a given country will be assigned a risk weight one category less favourable than that assigned to claims on the sovereign of that country. However, for claims on banks in countries with sovereigns rated BB+ to B- and on banks in unrated countries the risk weight will be capped at 100%.

36. The second option bases the risk weighting on the external credit assessment of the bank itself with claims on unrated banks being risk-weighted at 50%. Under this option, a preferential risk weight that is one category more favourable may be applied to claims with an original maturity¹⁴ of three months or less, subject to a floor of 20%. This treatment will be available to both rated and unrated banks, but not to banks risk weighted at 150%.

37. The two options are summarised in the tables below.

Option 1

Credit assessment of Sovereign	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
Risk weight under Option 1	20%	50%	100%	100%	150%	100%

¹⁴ Supervisors should ensure that claims with (contractual) original maturity under 3 months which are expected to be rolled over (i.e. where the effective maturity is longer than 3 months) do not qualify for this preferential treatment for capital adequacy purposes.

Option 2

Credit assessment of Banks	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
Risk weight under Option 2	20%	50%	50%	100%	150%	50%
Risk weight for short-term claims ¹⁵ under Option 2	20%	20%	20%	50%	150%	20%

38. When the national supervisor has chosen to apply the preferential treatment for claims on the sovereign as described in paragraph 28, it can also assign, under both options 1 and 2, a risk weight that is one category less favourable than that assigned to claims on the sovereign, subject to a floor of 20%, to claims on banks of an original maturity of 3 months or less denominated and funded in the domestic currency.

(v) *Claims on securities firms*

39. Claims on securities firms may be treated as claims on banks provided these firms are subject to supervisory and regulatory arrangements comparable to those under the New Accord (including, in particular, risk-based capital requirements)¹⁶. Otherwise such claims would follow the rules for claims on corporates.

(vi) *Claims on corporates*

40. The table provided below illustrates the risk weighting of rated corporate claims, including claims on insurance companies. The standard risk weight for unrated claims on corporates will be 100%. No claim on an unrated corporate may be given a risk weight preferential to that assigned to its sovereign of incorporation.

Credit assessment	AAA to AA-	A+ to A-	BBB+ to BB-	Below BB-	Unrated
Risk weight	20%	50%	100%	150%	100%

41. Supervisory authorities should increase the standard risk weight for unrated claims where they judge that a higher risk weight is warranted by the overall default experience in their jurisdiction. As part of the supervisory review process, supervisors may also consider whether the credit quality of corporate claims held by individual banks should warrant a standard risk weight higher than 100%.

¹⁵ Short-term claims in Option 2 are defined as having an original maturity of three months or less. These tables do not reflect the potential preferential risk weights for domestic currency claims that banks may be allowed to apply based on paragraph 38.

¹⁶ That is capital requirements that are comparable to those applied to banks in this revised Accord. Implicit in the meaning of the word “comparable” is that the securities firm (but not necessarily its parent) is subject to consolidated regulation and supervision with respect to any downstream affiliates.

(vii) *Claims included in the regulatory retail portfolios*

42. Claims that qualify under the criteria listed in paragraph 43 may be considered as retail claims for regulatory capital purposes and included in a regulatory retail portfolio. Exposures included in such a portfolio may be risk-weighted at 75%, except as provided in paragraph 46 for past due assets.

43. To be included in the regulatory retail portfolio, claims must meet the following four criteria:

- Orientation criterion - The exposure is to an individual person or persons or to a small business;
- Product criterion - The exposure takes the form of any of the following: revolving credits and lines of credit (including credit cards and overdrafts), personal term loans and leases (e.g. instalment loans, auto loans and leases, student and educational loans, personal finance) and small business facilities and commitments. Securities (such as bonds and equities), whether listed or not, are specifically excluded from this category. Mortgage loans are excluded to the extent that they qualify for treatment as claims secured by residential property (see paragraph 44).
- Granularity criterion - No aggregate exposure to one counterpart¹⁷ can exceed 0.2% of the overall regulatory retail portfolio.
- Low value of individual exposures. The maximum aggregated retail exposure to one counterpart cannot exceed an absolute threshold of € 1 million.

(viii) *Claims secured by residential property*

44. Lending fully secured by mortgages on residential property that is or will be occupied by the borrower, or that is rented, will be risk weighted at 40%. In applying the 40% weight, the supervisory authorities should satisfy themselves, according to their national arrangements for the provision of housing finance, that this concessionary weight is applied restrictively for residential purposes and in accordance with strict prudential criteria, such as the existence of substantial margin of additional security over the amount of the loan based on strict valuation rules. Member countries should increase the standard risk weight where they judge the criteria is not met. In addition, when such claims are past due for more than 90 days they will be risk weighted at 100%.

(ix) *Claims secured by commercial real estate*

45. In view of the experience in numerous countries that commercial property lending has been a recurring cause of troubled assets in the banking industry over the past few decades, the Committee holds to the view that mortgages on commercial real estate do not, in principle, justify other than a 100% weighting of the loans secured.¹⁸

¹⁷ Aggregated exposure means gross amount (i.e. not taking any credit risk mitigation into account) of all forms of debt exposures (e.g. loans or commitments) that individually satisfy the three other criteria. In addition, "on one counterpart" means one or several entities that may be considered as a single beneficiary (e.g. in the case of a small business that is affiliated to another small business, the limit would apply to the bank's aggregated exposure on both businesses).

¹⁸ The Committee, however, recognises that, in exceptional circumstances for well-developed and long-established markets, mortgages on office and/or multi-purpose commercial premises and/or multi-tenanted

(x) *Higher-risk categories*

46. The following claims will be risk weighted at 150% or higher:

- Claims on sovereigns, PSEs, banks, and securities firms rated below B-.
- Claims on corporates rated below BB-.
- The unsecured portion of any asset (other than a qualifying residential mortgage loan) that is past due for more than 90 days, net of specific provisions. For the purpose of defining the secured portion of the past due asset, eligible collateral and guarantees will be the same as for credit risk mitigation purposes (see section B of the standardised approach).¹⁹ Past due retail claims cannot be included in the regulatory retail portfolios to calculate the granularity limit, as specified in paragraph 43, for risk-weighting purposes.
- Securitisation tranches that are rated between BB+ and BB- will be risk weighted at 350% as set out in paragraph [518]

47. National supervisors may decide to apply a 150% or higher risk weight reflecting the higher risks associated with some other assets, such as venture capital and private equity investments.

(xi) *Other assets*

48. The treatment of exposures related to asset securitisation is presented separately in section IV. The standard risk weight for all other assets will be 100%.²⁰ Investments in equity or regulatory capital instruments issued by banks or securities firms will be risk weighted at 100%, unless deducted from the capital base according to Part I of the present framework (Scope of Application).

(xii) *Off-balance sheet items*

49. Off-balance-sheet items under the standardised approach will be converted into credit exposure equivalents through the use of credit conversion factors. Counterparty risk weightings of OTC derivative transactions will not be subject to any specific ceiling.

50. Commitments with an original maturity up to one year and commitments with an original maturity over one year will receive, respectively a credit conversion factor of 20%

commercial premises may have the potential to receive a preferential risk weight of 50% for the tranche of the loan that does not exceed the lower of 50 % of the market value or 60 % of the mortgage lending value of the property securing the loan. Any exposure beyond these limits will receive a 100% risk weight. This exceptional treatment will be subject to very strict conditions. In particular, two tests must be fulfilled, namely that (i) losses stemming from commercial real estate lending up to the lower of 50 % of the market value or 60 % of loan-to-value (LTV) based on mortgage-lending-value (MLV) must not exceed 0.3 % of the outstanding loans in any given year; and that (ii) overall losses stemming from commercial real estate lending must not exceed 0.5 % of the outstanding loans in any given year. This is, if either of these tests is not satisfied in a given year, the eligibility to use this treatment will cease and the original eligibility criteria would need to be satisfied again before it could be applied in the future. Countries applying such a treatment must publicly disclose that these and other additional conditions (that are available from the Basel Committee Secretariat) are met. When claims benefiting from such an exceptional treatment have fallen past due, they will be risk-weighted at 100%.

¹⁹ There will be a transitional period of three years during which a wider range of collateral may be recognised, subject to national discretion.

²⁰ However, at national discretion, gold bullion held in own vaults or on an allocated basis to the extent backed by bullion liabilities can be treated as cash and therefore risk-weighted at 0%.

and 50%. However, any commitments that are unconditionally cancellable, or that effectively provide for automatic cancellation, due to deterioration in a borrower's creditworthiness, at any time by the bank without prior notice will receive a 0% credit conversion factor.²¹

51. A credit conversion factor of 100% will be applied to the lending of banks' securities or the posting of securities as collateral by banks, including instances where these arise out of repo-style transactions (i.e. repurchase/reverse repurchase and securities lending/securities borrowing transactions). See section B2 of the CRM section for the calculation of risk weighted assets where the credit converted exposure is secured by eligible collateral.

2. External credit assessments

(i) The recognition process

52. National supervisors are responsible for determining whether an external credit assessment institution (ECAI) meets the criteria listed in the paragraph below. The assessments of ECAs may be recognised on a limited basis, e.g. by type of claims or by jurisdiction. The supervisory process for recognising ECAs should be made public to avoid unnecessary barriers to entry.

(ii) Eligibility criteria

53. An ECAI must satisfy each of the following six criteria.

- **Objectivity:** The methodology for assigning credit assessments must be rigorous, systematic, and subject to some form of validation based on historical experience. Moreover, assessments must be subject to ongoing review and responsive to changes in financial condition. Before being recognised by supervisors, an assessment methodology for each market segment, including rigorous back testing, must have been established for at least one year and preferably three years.
- **Independence:** An ECAI should be independent and should not be subject to political or economic 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 of directors or the shareholder structure of the assessment institution may be seen as creating a conflict of interest.
- **International access/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.
- **Disclosure:** An ECAI should disclose the following information: its assessment methodologies, including the definition of default, the time horizon, and the meaning of each rating; the actual default rates experienced in each assessment category; and the transitions of the assessments, e.g. the likelihood of AA ratings becoming A over time.
- **Resources:** An ECAI should have sufficient resources to carry out high quality credit assessments. These resources should allow for substantial ongoing contact

²¹ In certain countries, retail commitments are considered unconditionally cancellable if the terms permit the bank to cancel them to the full extent allowable under consumer protection and related legislation.

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.

- **Credibility.** To some extent, credibility is derived from the criteria above. In addition, the reliance on an ECAI's external credit assessments by independent parties (investors, insurers, trading partners) is evidence of the credibility of the assessments of an ECAI. The credibility of an ECAI is also underpinned by the existence of internal procedures to prevent the misuse of confidential information. In order to be eligible for recognition, an ECAI does not have to assess firms in more than one country.

3. Implementation considerations

(i) The mapping process

54. Supervisors will be responsible for assigning eligible ECAIs' assessments to the risk weights available under the standardised risk weighting framework, i.e. deciding which assessment categories correspond to which risk weights. The mapping process should be objective and should result in a risk weight assignment consistent with that of the level of credit risk reflected in the tables above. It should cover the full spectrum of risk weights.

55. When conducting such a mapping process, factors that supervisors should assess include, among others, the size and scope of the pool of issuers that each ECAI covers, the range and meaning of the assessments that it assigns, and the definition of default used by the ECAI. In order to promote a more consistent mapping of assessments into the available risk weights and help supervisors in conducting such a process, annex 2 provides guidance as to how such a mapping process may be conducted.

56. Banks must use the chosen ECAIs and their ratings consistently for each type of claim, for both risk weighting and risk management purposes. Banks will not be allowed to "cherry-pick" the assessments provided by different ECAIs.

57. Banks must disclose ECAI's that they use for the risk weighting of their assets by type of claims, the risk weights associated with the particular rating grades as determined by supervisors through the mapping process as well as the aggregated risk weighted assets for each risk weight based on the assessments of each eligible ECAI.

(ii) Multiple assessments

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

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

60. If there are three or more assessments with different risk weights, the assessments corresponding to the two lowest risk weights should be referred to and the higher of those two risk weights will be applied.

(iii) Issuer versus issues assessment

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

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

62. Whether the bank intends to rely on an issuer- or an issue-specific assessment, the assessment must take into account and reflect the entire amount of credit risk exposure the bank has with regard to all payments owed to it.²²

63. In order to avoid any double counting of credit enhancement factors, no supervisory recognition of credit risk mitigation techniques will be taken into account if the credit enhancement is already reflected in the issue specific rating (see paragraph 76).

(iv) Domestic currency and foreign currency assessments

64. Where unrated exposures are risk weighted based on the rating of an equivalent exposure to that borrower, the general rule is that foreign currency ratings would be used for exposures in foreign currency. Domestic currency ratings, if separate, would only be used to risk weight claims denominated in the domestic currency.²³

(v) Short term/long term assessments

65. For risk-weighting purposes, short-term assessments are deemed to be issue specific. They can only be used to derive risk weights for claims arising from the rated facility. They cannot be generalised to other short-term claims, except under the conditions of paragraph 67. In no event can a short-term rating be used to support a risk weight for an unrated long-term claim. Short-term assessments may only be used for short-term claims against banks and corporates. The table below provides a framework for banks’ exposures to specific short-term facilities, such as a particular issuance of commercial paper:

²² For example, if a bank is owed both principal and interest, the assessment must fully take into account and reflect the credit risk associated with repayment of both principal and interest.

²³ However, when an exposure arises through a bank's sub-participation in a loan that has been extended by a Multilateral Development Bank (MDB) whose preferred creditor status is recognised in the market and transferred to the sub-participants, its convertibility and transfer risk can be considered to be effectively mitigated by national supervisory authorities. In such cases the borrower's domestic currency rating may be used for risk weighting purposes instead of his foreign currency rating.

Credit assessment	A1/P1 ²⁴	A2/P2	A3/P3	Others ²⁵
Risk weight	20%	50%	100%	150%

66. If a short-term rated facility attracts a 50% risk-weight, unrated short-term claims cannot attract a risk weight lower than 100%. If an issuer has a short-term facility with an assessment that warrants a risk weight of 150%, all unrated claims, whether long-term or short-term, should also receive a 150% risk weight, unless the bank uses recognised credit risk mitigation techniques for such claims.

67. In cases where national supervisors have decided to apply option 2 under the standardised approach to short term interbank claims to banks in their jurisdiction, the interaction with specific short-term assessments is expected to be the following:

- The general preferential treatment for short-term claims, as defined under paragraphs 36 and 38, applies to all claims on banks of up to three months original maturity when there is no specific short-term claim assessment.
- When there is a short-term assessment and such an assessment maps into a risk weight that is more favourable (i.e. lower) or identical to that derived from the general preferential treatment, the short-term assessment should be used for the specific claim only. Other short-term claims would benefit from the general preferential treatment.
- When a specific short-term assessment for a short term claim on a bank maps into a less favourable (higher) risk weight, the general short-term preferential treatment for interbank claims cannot be used. All unrated short-term claims should receive the same risk weighting as that implied by the specific short-term assessment.

68. When a short-term assessment is to be used, the institution making the assessment needs to meet all of the eligibility criteria for recognising ECAs as presented in paragraph 53 in terms of its short-term assessment.

(vi) *Level of application of the assessment*

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

(vii) *Unsolicited ratings*

70. As a general rule, banks should use *solicited* ratings from eligible ECAs. National supervisory authorities may, however, allow banks to use *unsolicited* ratings in the same way as solicited ratings. However, there may be the potential for ECAs to use unsolicited ratings to put pressure on entities to obtain solicited ratings. Such behaviour, when identified, should cause supervisors to consider whether to continue recognising such ECAs as eligible for capital adequacy purposes.

²⁴ The notations follow the methodology used by Standard & Poors and by Moody's investors Service. The A1 rating of Standard and Poors includes both A1+ and A1.

²⁵ This category includes all non-prime and B or C ratings.

B. The standardised approach - Credit risk mitigation

1. Overarching issues

(i) Introduction

71. Banks use a number of techniques to mitigate the credit risks to which they are exposed. Exposure may be collateralised in whole or in part with cash or securities, a loan exposure may be guaranteed by a third party, or a bank may buy a credit derivative to offset various forms of credit risk. Additionally banks may agree to net loans owed to them against deposits from the same counterparty.

72. Where these various techniques meet the requirements for legal certainty as described in paragraph 80 and 81 below, the revised approach to credit risk mitigation (CRM) allows a wider range of credit risk mitigants to be recognised for regulatory capital purposes than is permitted under the 1988 Capital Accord.

(ii) General Remarks

73. The framework set out in this section II is applicable to the banking book exposures in the standardised approach. For the treatment of CRM in the two IRB approaches, see section III.

74. The comprehensive approach for the treatment of collateral (see below paragraphs 93-101 and 108-145) will also be applied to calculate the counterparty risk charges for OTC derivatives and repo-style transactions booked in the trading book.

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

76. The effects of CRM will not be double counted. Therefore, no additional supervisory recognition of CRM for regulatory capital purposes will be granted on claims for which an issue-specific rating is used that already reflects that CRM. As stated in paragraph 62 of the section on the standardised approach, principal-only ratings will also not be allowed within the framework of CRM.

77. Whilst Banks use CRM techniques to reduce their credit risk, these techniques give rise to risks (residual risks) which may render the overall risk reduction less effective. Where these risks are not adequately controlled, Supervisors may impose additional capital charges or take other supervisory actions as detailed in Pillar 2 (to be specified in the Third Consultative Document).

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

79. The Pillar 3 requirements must also be observed for banks to obtain capital relief in respect of any CRM techniques (to be specified in the Third Consultative Document).

(iii) Legal Certainty

80. In order for banks to obtain capital relief for any transaction in which CRM techniques are used, the following minimum standards for legal documentation must be met.

81. 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. Banks must have appropriate legal opinions to verify this, and update them as necessary to ensure continuing enforceability.

2. Overview of Credit Risk Mitigation Techniques²⁶

(i) Collateralised transactions

82. A collateralised transaction is one in which:

- banks have a credit exposure or potential credit exposure to a counterparty;²⁷ and
- that credit exposure or potential credit exposure is hedged in whole or in part by collateral posted by the counterparty or by a third party on behalf of the counterparty.

83. Where banks take eligible collateral (e.g. cash or securities, more specifically defined in paragraphs 108 and 109 below) they are allowed to reduce their credit exposure to a counterparty when calculating their capital requirements to take account of the risk mitigating effect of the collateral.

Overall framework and minimum conditions

84. Banks may opt for either the simple approach, which, similar to the 1988 Capital Accord, substitutes the risk weighting of the collateral for the risk weighting of the counterparty for the collateralised portion of the exposure (generally subject to a 20% floor), or for the comprehensive approach, which allows fuller offset of collateral against exposures, by effectively reducing the exposure amount by the value ascribed to the collateral. Banks may operate under either, but not both, approaches in the banking book, but only under the comprehensive approach in the trading book. Partial collateralisation is recognised in both approaches. Mismatches in the maturity of the underlying exposure and the collateral will only be allowed under the comprehensive approach.

85. However, before capital relief will be granted in respect of any form of collateral, the standards set out below in paragraphs 86 to 89 must be met under either approach.

86. In addition to the general requirements for legal certainty set out in paragraphs 80 and 81, the legal mechanism by which collateral is pledged must ensure that the bank has clear rights over it, and may liquidate or take legal possession of it, in a timely manner, in the event of the default, insolvency or bankruptcy (or otherwise-defined credit event set out in the transaction documentation) of the counterparty (and, where applicable, of the custodian holding the collateral). Furthermore banks must take all steps necessary to fulfil local requirements for obtaining and maintaining an enforceable security interest, e.g. by registering it with a registrar.

²⁶ See Annex 7 for an overview of methodologies for the capital treatment of transactions secured by financial collateral under the standardised and IRB approaches.

²⁷ In this section “counterparty” is used to denote a party to whom a bank has an on- or off-balance sheet credit exposure or a potential credit exposure. That exposure may, for example, take the form of a loan of cash or securities (where the counterparty would traditionally be called the borrower), of securities posted as collateral, of a commitment or of exposure under an OTC derivatives contract.

87. In order for collateral to provide protection, the credit quality of the counterparty and the value of the collateral must not have a material positive correlation. For example, securities issued by the counterparty - or by any related group entity – would provide little protection and so would be ineligible.

88. Banks must have clear and robust procedures for the timely liquidation of collateral to ensure that any legal conditions required for declaring the default of the counterparty and liquidating the collateral are observed, and that collateral is liquidated promptly.

89. Where the collateral is held by a custodian, banks must take reasonable steps to ensure that the custodian segregates the collateral from its own assets.

90. A capital requirement will be applied to banks on either side of the collateralised transaction: for example, both repos and reverse repos will be subject to capital requirements. Likewise, both sides of the 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.

91. Where a bank, acting as agent, arranges a repo-style transaction (i.e. repurchase/reverse repurchase and securities lending/borrowing transactions) between a customer and a third party and provides a guarantee to the customer that the third party will perform on its obligations, then the risk to the bank is the same as if the bank had entered into the transaction as principal. In such circumstances, banks will be required to calculate capital requirements as if they were themselves the principal.

The simple approach

92. In the simple approach the risk weighting of the collateral instrument collateralising or part collateralising the exposure is substituted for the risk weighting of the counterparty. Details of this framework are provided in paragraphs 146 to 150.

The comprehensive approach

93. In the comprehensive approach, when taking collateral, banks will need to calculate their adjusted exposure to a counterparty for capital adequacy purposes to take account of the effects of that collateral. Using haircuts, banks are required to adjust both the amount of the exposure to the counterparty and the value of any collateral received in support of that counterparty to take account of future fluctuations in the value of each,²⁸ occasioned by market movements. This will produce volatility adjusted amounts for both exposure and collateral. Unless either is cash, the volatility adjusted amount for exposure will be bigger than the exposure and for collateral it will be lower.

94. Additionally where the exposure and collateral are held in different currencies an additional downwards adjustment must be made to the volatility adjusted collateral amount to take account of future fluctuations in exchange rates.

95. Where the volatility adjusted exposure amount is greater than the volatility adjusted collateral amount (including any further adjustment for foreign exchange risk), banks shall calculate their risk weighted assets as the difference between the two multiplied by the risk

²⁸ Exposure amounts may vary where, for example, securities are being lent.

weight of the counterparty. The precise framework for performing these calculations are set out in paragraphs 110 to 113.

96. In principle, banks will have two ways of calculating the haircuts: standard supervisory haircuts, using fixed levels provided by the Basel Committee and own-estimate haircuts, using bank's own internal estimates of market price volatility. Supervisors will allow banks to use own-estimate haircuts only when they fulfil certain qualitative and quantitative criteria.

97. A bank may choose to use standard or own-estimate haircuts independently of the choice it has made between the standardised approach and the foundation IRB approach to credit risk. However, if banks seek to use their own-estimate haircuts, they must do so for the full range of instrument types for which they would be eligible to use own-estimates, excluding immaterial portfolios where they may use the standard supervisory haircuts.

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

99. For certain types of repo-style transactions (broadly speaking government bond repos as defined in paragraphs 133 and 134) supervisors may allow banks using standard supervisory haircuts or own-estimate haircuts not to apply these in calculating the exposure amount after risk mitigation.

100. The effect of master netting agreements covering repo-style transactions can be recognised for the calculation of capital requirements subject to the conditions in paragraph 136.

101. As a further alternative to standard supervisory haircuts and own-estimate haircuts banks may use VaR models for calculating potential price volatility for repo-style transactions as set out in paragraphs 141 to 145 below.

(ii) On-balance sheet netting

102. Where banks have legally enforceable netting arrangements for loans and deposits they may calculate capital requirements on the basis of net credit exposures subject to the conditions in paragraph 153.

(iii) Guarantees and credit derivatives

103. Where guarantees or credit derivatives are direct, explicit, irrevocable and unconditional, and supervisors are satisfied that banks fulfil certain minimum operational conditions relating to risk management processes they may allow banks to take account of such credit protection in calculating capital requirements.

104. A range of guarantors and protection providers are recognised. As under the 1988 Capital Accord, a substitution approach will be applied. Thus only guarantees issued by or protection provided by entities with a lower risk weight than the counterparty will lead to reduced capital charges since the protected portion of the counterparty exposure is assigned the risk weight of the guarantor or protection provider, whereas the uncovered portion retains the risk weight of the underlying counterparty.

105. Detailed operational requirements are noted below in paragraphs 154 to 157.

(iv) *Maturity mismatch*

106. Where the residual maturity of the CRM is less than that of the underlying credit exposure a maturity mismatch occurs. Where there is a maturity mismatch and the CRM has a residual maturity of less than one year, the CRM is not recognised for capital purposes. In other cases where there is a maturity mismatch, partial recognition is given to the CRM for regulatory capital purposes as detailed below in paragraphs 166 to 168. Under the simple approach for collateral maturity mismatches will not be allowed.

(v) *Miscellaneous*

107. Treatments for pools of credit risk mitigants and first- and second-to-default credit derivatives are given in paragraphs 169–173 below.

3. Collateral

(i) *Eligible Collateral*

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

(a)	Cash on deposit with the bank which is incurring the counterparty exposure including certificate of deposits or comparable instruments issued by the lending bank ^{29, 30}
(b)	Gold
(c)	Debt securities rated by a recognised external credit assessment institution where these are either: <ul style="list-style-type: none">• at least BB- when issued by sovereigns and public sector entities (PSEs) that are treated as sovereigns by the national supervisor; or• at least BBB- when issued by other issuers (including banks and securities firms); or• at least A3/P3
(d)	Debt securities not rated by a recognised external credit assessment institution where these are: <ul style="list-style-type: none">• issued by a bank; and• listed on a recognised exchange; and• qualify as senior debt; and

²⁹ Where a bank issues credit-linked notes against exposures in the banking book, the exposures will be treated as being collateralised by cash.

³⁰ When cash on deposit, certificate of deposits or comparable instruments issued by the lending bank are held as collateral at a third-party bank, if they are openly pledged/assigned to the lending bank and if the pledge/assignment is unconditional and irrevocable, the exposure amount covered by the collateral (after any necessary haircuts for currency risk) will receive the risk weight of the third-party bank.

- all other rated issues of the same seniority by the issuing bank are rated at least BBB- or A3/P3 by a recognised external credit assessment institution; and
- the bank holding the securities as collateral has no information to suggest that the issue justifies a rating below BBB- or A3/P3 (as applicable) and;
- the supervisor is sufficiently confident about the market liquidity of the security

(e) Equities that are included in a main index

(f) Undertakings for Collective Investments in Transferable Securities (UCITS) and mutual funds where:

- a price for the units is publicly quoted daily; and
 - the UCITS/mutual fund is limited to investing in the instruments listed in this paragraph³¹
-

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

(a) All of the instruments in the above table

(b) Equities which are not included in a main index but are listed on a recognised exchange

(c) UCITS/Mutual Funds which include such equities

(ii) *The comprehensive approach*

Calculation of capital requirement

110. For a collateralised transaction, the exposure amount after risk mitigation is calculated as follows, where

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

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

³¹ However, the use or potential use by a UCITS /Mutual fund of derivative instruments solely to hedge investments listed in this paragraph and paragraph 109 shall not prevent units in that UCITS/Mutual fund from being eligible collateral.

Hfx= haircut appropriate for currency mismatch between the collateral and exposure

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

112. The treatment for transactions where there is a mismatch between the maturity of the counterparty exposure and the collateral is given in paragraphs 166 to 168.

113. 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 in the basket and H_i the haircut applicable to that asset.

Standard supervisory haircuts

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

Issue rating for debt securities	Residual Maturity	Sovereigns ^{32, 33}	Other issuers ³⁴
AAA-AA-/A1	≤ 1 year	0.5	1
	>1 year, ≤ 5 years	2	4
	> 5 years	4	8
A+-BBB-/A2/A3 and unrated bank securities per para 108d)	≤ 1 year	1	2
	>1 year, ≤ 5 years	3	6
	> 5 years	6	12
BB+-BB-	All	15	
Main index equities and Gold		15	
Other equities listed on a recognised exchange		25	
UCITS/Mutual funds		Highest haircut applicable to any security in which the fund can invest	
Cash in the same currency ³⁵		0	

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

116. For transactions in which the bank lends non-eligible instruments (e.g. non-investment grade corporate debt securities), the haircut to be applied on the exposure should

³² Includes PSEs which are treated as sovereigns by the national supervisor.

³³ Multilateral development banks receiving a 0% risk weight will be treated as sovereigns.

³⁴ Includes PSEs which are not treated as sovereigns by the national supervisor.

³⁵ Eligible cash collateral specified in paragraph 108 a)

be the same as the one for equity traded on a recognised exchange that is not part of a main index.

Own estimates for haircuts

117. Supervisors may permit banks to calculate H using their own internal estimates of market price volatility and foreign exchange volatility. Permission to do so will be conditional on the satisfaction of minimum qualitative and quantitative standards stated in paragraphs 119-128. When debt securities are rated BBB-/A-3 or higher, supervisors may allow banks to calculate a volatility estimate for each category of security. Such estimates must be representative of the securities actually included in the category for that bank. A category is defined as the individual boxes in the table in paragraph 114. For debt securities rated below BBB-/A-3 or for equities eligible as collateral (lightly shaded boxes in the above table), the haircuts must be calculated for each individual security.

118. Banks must estimate the volatility of the collateral instrument or foreign exchange mismatch individually: estimated volatilities must not take into account the correlations between unsecured exposure, collateral and exchange rates (see paragraphs 166 to 168 for the approach to maturity mismatches).

(a) Quantitative Criteria

119. In calculating the haircuts, a 99th percentile one-tailed confidence interval is to be used.

120. The minimum holding period will be dependent on the type of transaction and the frequency of remargining or marking to market. The minimum holding periods for different types of transactions are presented in paragraph 130. Banks may use haircut numbers calculated according to shorter holding periods, scaled up to the appropriate holding period by the square root of time formula.

121. Banks must take into account the illiquidity of lower-quality assets. The holding period should be adjusted upwards in cases where such a holding period would be inappropriate given the liquidity of the collateral. They should also identify where historical data may understate potential volatility, e.g. a pegged currency. Such cases must be dealt with by subjecting the data to stress testing.

122. The choice of historical observation period (sample period) for calculating haircuts shall be a minimum of one year. For banks that use a weighting scheme or other methods for the historical observation period, the “effective” observation period must be at least one year (that is, the weighted average time lag of the individual observations cannot be less than 6 months).

123. Banks should update their data sets no less frequently than once every three months and should also reassess them whenever market prices are subject to material changes. This implies that haircuts must be computed at least every three months. The supervisory authority may also require a bank to calculate its haircuts using a shorter observation period if, in the supervisor's judgement, this is justified by a significant upsurge in price volatility.

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

(b) *Qualitative Criteria*

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

126. Banks should have robust processes in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operation of the risk measurement system.

127. The risk measurement system should be used in conjunction with internal exposure limits.

128. An independent review of the risk measurement system should be carried out regularly in the bank's own internal auditing process. A review of the overall risk management process should take place at regular intervals (ideally not less than once a year) and should specifically address, at a minimum:

- the integration of risk measures into daily risk management;
- the validation of any significant change in the risk measurement process;
- the accuracy and completeness of position data;
- the verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources; and
- the accuracy and appropriateness of volatility assumptions.

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

129. For some transactions, depending on the nature and frequency of the revaluation and remargining provisions, different holding periods are appropriate. The framework for collateral haircuts distinguishes between repo-style transactions (i.e. repo/reverse repos and securities lending/borrowing), "other capital-market-driven transactions" (i.e. OTC derivatives transactions and margin lending) and secured lending. In capital-market-driven transactions and repo-style transactions, the documentation contains remargining clauses; in secured lending transactions, it generally does not.

130. The minimum holding period for various products is summarised in the following table.

Transaction type	Minimum holding period	Condition
Repo-style transaction	five business days	daily remargining
Other capital market transactions	ten business day	daily remargining
Secured lending	twenty business days	daily revaluation

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

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

where:

H = haircut

- H_M = haircut under the minimum holding period
- T_M = minimum holding period for the type of transaction
- N_R = actual number of days between remargining for capital market transactions or revaluation for secured transactions.

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

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

- T_N = holding period used by the bank for deriving H_N
- H_N = haircut based on the holding period T_N

132. For banks using the standard supervisory haircuts, the 10-business day haircuts provided in paragraph 114 will be the basis and this haircut will be scaled up or down depending on the type of transaction and the frequency of remargining or revaluation using the formula below:

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

where:

- H = haircut
- H_{10} = 10-business day standard supervisory haircut for instrument
- N_R = actual number of days between remargining for capital market transactions or revaluation for secured transactions.
- T_M = minimum holding period for the type of transaction

Conditions for zero H

133. For repo-style transactions where the following conditions are satisfied, and the counterparty is a *core market participant*, supervisors may choose not to apply the haircuts specified in the comprehensive approach and may instead apply a zero H . This carve-out will not be available for banks using the VaR modelling approach as described in paragraphs 141-145.

-
- (a) Both the exposure and the collateral are cash or a sovereign or PSE security qualifying for a 0% risk weight in the standardised approach,³⁶
-
- (b) Both the exposure and the collateral are denominated in the currency of the
-

³⁶ Note that where a supervisor has designated domestic-currency claims on its sovereign or central bank to be eligible for a 0% risk weight in the standardised approach, such claims will satisfy this condition.

	sovereign or PSE security concerned;
(c)	Either the transaction is overnight or both the exposure and the collateral are marked-to-market daily and are subject to daily remargining;
(d)	Following a counterparty's failure to remargin, the time between the last mark to market before the failure to remargin and the liquidation ³⁷ of the collateral is no more than four business days;
(e)	The transaction is settled across a settlement system proven for that type of transaction in the jurisdiction or currency area in which the securities are issued;
(f)	The documentation covering the agreement is standard market documentation for repo-style transactions in the securities concerned;
(g)	The transaction is governed by documentation specifying that if the counterparty fails to satisfy an obligation to deliver cash or securities or to deliver margin or otherwise defaults, then the transaction is immediately terminable; and
(h)	Upon any default event, regardless of whether the counterparty is insolvent or bankrupt, the bank has the unfettered, legally enforceable right to immediately seize and liquidate the collateral for its benefit.

134. *Core market participants* may include, at the discretion of the national supervisor, the following entities:

(a)	Sovereigns, central banks and PSEs;
(b)	Banks and securities firms;
(c)	Other financial companies (including insurance companies) eligible for a 20% risk weight;
(d)	Regulated mutual funds that are subject to capital or leverage requirements;
(e)	Regulated pension funds; and
(f)	Recognised clearing organisations.

135. Where a supervisor applies a specific carve-out to repo-style transactions in securities issued by its domestic government, then other supervisors may choose to allow banks incorporated in their jurisdiction to adopt the same approach to the same transactions.

Treatment of repo-style transactions with master netting agreements

136. 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, netting agreements must:

³⁷ This does not require the bank to always liquidate the collateral but rather to have the capability to do so within the given time frame.

-
- (a) give the non-defaulting party the unfettered, legally enforceable right to immediately close-out all transactions under the agreement upon the event of default, including in the event of bankruptcy of the counterparty;
-
- (b) allow for the prompt liquidation of collateral upon the event of default; and,
-
- (c) provide for the netting of gains and losses on transactions closed out under a master agreement so that a single net amount is owed by one party to the other.
-

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

All transactions are marked to market daily³⁸

The collateral instrument used in the transactions are recognised as eligible collateral in the banking book

138. The formula in paragraph 110 will be adapted to calculate the capital requirements for transactions with netting agreements.

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

$$E^* = \max \{0, [(\sum(E) - \sum(C)) + \sum (E_s \times H_s) + (\sum (E_{fx}) \times H_{fx})]\}^{39}$$

where:

E^* = the exposure value after risk mitigation

E = current value of the exposure

C = the value of the collateral received

E_s = absolute value of the net position in a given security

H_s = haircut appropriate to E_s

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

H_{fx} = haircut appropriate for currency mismatch

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

³⁸ The holding period for the haircuts will depend as in other repo-style transactions on the frequency of margining.

³⁹ The starting point for this formula is the formula in paragraph 110 which can also be presented as the following.

$$E^* = (E-C) + (E \times H_e) + (C \times H_c) + (C \times H_{fx})$$

involved in the transactions and for foreign exchange risk if any. The net long or short position of each security included in the netting agreement will be multiplied with the appropriate haircut. All other rules regarding the calculation of haircuts stated in paragraphs 110 to 135 equivalently apply for banks using bilateral netting agreements for repo-style transactions.

Use of VaR models

141. As an alternative to the use of standard or own-estimate haircuts, banks may be permitted to use a VaR modelling 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 only to repo-style transactions covered by bilateral netting agreements on a counterparty-by-counterparty basis. The VaR models approach is available to banks that have received supervisory recognition for an internal market risk model under the 1996 Market Risk Amendment. Banks which have not received supervisory recognition for use of models under the 1996 Market Risk Amendment can separately apply for supervisory recognition to use their internal VaR models for calculation of potential price volatility for repo-style transactions. Internal models will only be accepted when a bank can prove the quality of its model to the supervisor through the backtesting of its output using one year of data.

142. The quantitative and qualitative criteria for recognition of internal market risk models for repo-style transactions is in principle the same as the under the 1996 Market Risk Amendment. With regard to the holding period, the minimum will be 5-business days, rather than the 10-business days under the Market Risk Amendment.

143. [The Basel Committee plans to develop a backtesting framework for internal models covering repo-style transactions which would be broadly equivalent to that currently applied under the Market Risk regime. One of the difficulties in developing such a framework is the collection and processing of the profit and loss data that may be needed to evaluate the results of the VaR model. The Committee seeks comments on how a practical framework could be developed.

144. Banks using their VaR models will be required to backtest its output using the most recent 250 daily observations. Depending on the number of exceptions exceeding the 99th percentile confidence level, the output of the VaR model will be scaled up using a multiplier as provided in the table below. This framework is similar to the “traffic light” approach applied for internal models in the Market Risk Amendment and equivalent rules will apply if the number of exceptions reaches ten or more.

Zone	Number of exceptions	multiplier
Green Zone	0	none (= 1)
	1	none (= 1)
	2	none (= 1)
	3	none (= 1)
	4	none (= 1)
Yellow Zone	5	2.0
	6	2.2
	7	2.4
	8	2.6
	9	2.8
Red Zone	10 or more	3.0

]

145. The calculation of the exposure E* for banks using their internal market risk models will be the following:

$$E^* = \max \{0, [(\sum E - \sum C) + (\text{VaR output from internal market risk models}^{40})]\}$$

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

(iii) *The simple approach*

Minimum conditions

146. For collateral to be recognised in the simple approach, the collateral must be pledged for at least the life of the exposure and it must be marked to market and revalued with a minimum frequency of six months. Those portions of claims collateralised by the market value of recognised collateral receive the risk weight applicable to the collateral instrument. The risk weight on the collateralised portion will be subject to a floor of 20% except under the conditions specified in the next four paragraphs. The remainder of the claim should be assigned to the risk weight appropriate to the counterparty. A capital requirement will be applied to banks on either side of the collateralised transaction: for example, both repos and reverse repos will be subject to capital requirements.

Exceptions to the risk weight floor

147. Transactions which fulfil the criteria enumerated in both Paragraphs 133 and 134 receive a risk weight of 0%. If the counterparty to the transactions is not a core market participant the transaction should receive a risk weight of 10%.

148. Transactions which fulfil the criteria enumerated in items a), c), d), f), g) and h) in paragraph 133, have no currency mismatch, and are settled across a settlement system proven for that type of transaction will receive a risk weight of 10%.

149. OTC derivative transactions subject to daily mark-to-market, collateralised by cash and where there is no currency mismatch should receive a 0% risk weight. Such transactions

⁴⁰ A multiplier would be applied to the output if necessary according the rules in paragraph 144.

collateralised by sovereign or PSE securities qualifying for a 0% risk weight in the standardised approach can receive a 10% risk weight.

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

- the collateral is cash on deposit⁴¹ and is securing an exposure in the same currency; or,
- the collateral is in the form of sovereign/PSE securities eligible for a 0% risk weight, and its market value has been discounted by 20%.

(iv) *Collateralised OTC derivatives transactions*

151. The calculation of the counterparty credit risk charge for an individual contract will be as follows:

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

where:

RC = the replacement cost,

add-on = the amount for potential future exposure calculated under the 1988 Capital Accord,

C_A = the volatility adjusted collateral amount under the comprehensive approach prescribed in paragraphs 110 to 135, and

r = the risk weight of the counterparty.

152. When effective bilateral netting contracts are in place, RC will be the net replacement cost and the add-on will be A_{Net} as calculated under the 1988 Capital Accord. The haircut for currency risk (Hfx) should be applied when there is a mismatch between the collateral currency and the settlement currency. Even in the case where there are more than two currencies involved in the exposure, collateral and close-out 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.

4. On-balance sheet netting

153. Where a bank,

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

⁴¹ Equivalent to eligible collateral defined in paragraph 108 a)

- (c) monitors and controls its roll-off risks; and
- (d) monitors and controls the relevant exposures on a net basis, it may use the net exposure of loans and deposits as the basis for its capital adequacy calculation in accordance with the formula in paragraph 110. Assets (loans) are treated as exposure and liabilities (deposits) as collateral. H will be zero except when a currency mismatch exists. A 10-business day holding period will apply when daily mark-to-market is conducted and all the requirements of paragraphs 114, 131, and 166-168 will apply.

5. Guarantees and credit derivatives

(i) Operational requirements

Operational requirements common to guarantees and credit derivatives

154. A guarantee/credit derivative must represent a direct claim on the protection provider and must be explicitly referenced to specific exposures, so that the extent of the cover is clearly defined and incontrovertible. Other than non-payment by a protection purchaser of money due in respect of the credit protection contract it must be irrevocable; there must be no clause in the contract that would allow the protection provider unilaterally to cancel the credit cover or that would increase the effective cost of cover as a result of deteriorating credit quality in the hedged exposure.⁴² It must also be unconditional; there should be no clause in the protection contract that could prevent the protection provider from being obliged to pay out in a timely manner in the event that the original counterparty fails to make the payment(s) due.

Additional operational requirements for guarantees

155. In addition to the legal certainty requirements in paragraphs 80 and 81 above, in order for a guarantee to be recognised, the following conditions must be satisfied:

-
- (a) On the qualifying default/non-payment of the counterparty, the bank may in a timely manner pursue the guarantor for monies outstanding under the documentation governing the transaction, rather than having to continue to pursue the counterparty. By making a payment under the guarantee the guarantor must acquire the right to pursue the obligor for monies outstanding under the documentation governing the transaction.
-
- (b) The guarantee is an explicitly documented obligation assumed by the guarantor.
-
- (c) The guarantor covers all types of payments the underlying obligor is expected to make under the documentation governing the transaction, for example notional amount, margin payments etc.
-

Additional operational requirements for credit derivatives

156. In order for a credit derivative contract to be recognised, the following conditions must be satisfied:

⁴² Note that the irrevocability condition does not require that the credit protection and the exposure be maturity matched; rather that the maturity agreed *ex ante* may not be reduced *ex post* by the protection provider. Paragraph 167 sets forth the treatment of call options in determining remaining maturity for credit protection.

-
- (a) The credit events specified by the contracting parties must at a minimum cover:
- failure to pay the amounts due under terms of the underlying obligation that are in effect at the time of such failure (with a grace period that is closely in line with the grace period in the underlying obligation);
 - bankruptcy, insolvency or inability of the obligor to pay its debts, or its failure or admission in writing of its inability generally to pay its debts as they become due, and analogous events; and
 - restructuring of the underlying obligation involving forgiveness or postponement of principal, interest or fees that results in a credit loss event (i.e. charge-off, specific provision or other similar debit to the profit and loss account).
-
- (b) If the credit derivative covers obligations that do not include the underlying obligation, Section (g) below governs whether the asset mismatch is permissible.
-
- (c) The credit derivative shall not terminate prior to expiration of any grace period required for a default on the underlying obligation to occur as a result of a failure to pay.
-
- (d) Credit derivatives allowing for cash settlement are recognized for capital purposes insofar as a robust valuation process is in place in order to estimate loss reliably. There must be a clearly specified period for obtaining post-credit-event valuations of the underlying obligation. If the reference obligation specified in the credit derivative for purposes of cash settlement is different than the underlying obligation, Section (g) below governs whether the asset mismatch is permissible.
-
- (e) If the protection purchaser's right/ability to transfer the underlying obligation to the protection provider is required for settlement, the terms of the underlying obligation must provide that any required consent to such transfer may not be unreasonably withheld;
-
- (f) The identity of the parties responsible for determining whether a credit event has occurred must be clearly defined. This determination must not be the sole responsibility of the protection seller. The protection buyer must have the right/ability to inform the protection provider of the occurrence of a credit event;
-
- (g) A mismatch between the underlying obligation and the reference obligation under the credit derivative (i.e. the obligation used for purposes of determining cash settlement value or the deliverable obligation) is permissible if (1) the reference obligation ranks pari passu with or is junior to the underlying obligation, and (2) the underlying obligation and reference obligation share the same obligor (i.e. the same legal entity) and have legally enforceable cross-default or cross-acceleration clauses.
-
- (h) A mismatch between the underlying obligation and the obligation used for purposes of determining whether a credit event has occurred is permissible if (1) the latter obligation ranks pari passu with or is junior to the underlying obligation, and (2) the underlying obligation and reference obligation share the same obligor (i.e. the same legal entity) and have legally enforceable cross-default or cross-acceleration clauses.
-

157. Only credit default swaps and total return swaps that provide credit protection equivalent to guarantees will be eligible for recognition. The following exception applies.

Where a bank buys credit protection through a total return swap and records the net payments received on the swap as net income, but does not record offsetting deterioration in the value of the asset that is protected (either through reductions in fair value or by an addition to reserves), the credit protection will not be recognised. The treatment of first-to-default and second-to-default products is provided separately in paragraphs 170 to 173.

158. Other types of credit derivatives will not be eligible for recognition at this time.⁴³

(ii) *Range of eligible guarantors/protection providers*

159. Credit protection given by the following entities will be recognised:

- sovereign entities⁴⁴, PSEs, banks⁴⁵ and securities firms with a lower risk weight than the counterparty;
- other entities rated A- or better. This would include credit protection provided by parent, subsidiary and affiliate companies when they have a lower risk weight than the obligor.

(iii) *Risk weights*

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

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

(a) *Proportional cover*

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

(b) *Tranched cover*

163. Where the bank transfers a portion of the risk of a loan in one or more tranches to a protection seller or sellers and retains some level of risk of the loan and the risk transferred and the risk retained are of different seniority banks may obtain credit protection for either the senior tranches (e.g. second loss portion) or the junior tranche (i.e. first loss portion). In this case the rules as set out in section IV (Credit risk - securitisation framework) will apply.

⁴³ Cash funded credit linked notes issued by the bank which fulfil the criteria for credit derivatives will be treated as cash collateralised transactions.

⁴⁴ This includes the Bank for International Settlements, the International Monetary Fund, the European Central Bank and the European Community.

⁴⁵ This includes multilateral development banks.

(iv) *Currency mismatches*

164. Where the credit protection is denominated in a currency different from that in which the exposure is denominated – i.e. there is a currency mismatch – the amount of the exposure deemed to be protected will be reduced by the application of a haircut H_{FX} , i.e.

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

where:

G = Nominal amount of the credit protection

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

The appropriate haircut based on a 10-business day holding period (assuming daily mark-to-marketing) will be applied. If a bank uses the supervisory haircuts it will be 8%. The haircuts must be scaled up using the square root of time formula, depending on the frequency of revaluation of the credit protection as described in paragraph 131.

(v) *Sovereign guarantees*

165. As specified in section II. A on general rules for the standardised approach, a lower risk weight may be applied at national discretion to a bank's exposures to the sovereign (or central bank) where the bank is incorporated and where the exposure is denominated in domestic currency and funded⁴⁶ in that currency. National authorities may extend this treatment to portions of claims guaranteed by the sovereign (or central bank), where the guarantee is denominated in the domestic currency and the exposure is funded in that currency.

6. Maturity mismatches

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

(i) *Definition of maturity*

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

⁴⁶ This is to say that the bank would also have liabilities denominated in the domestic currency.

(ii) *Risk weights for maturity mismatches*

168. Hedges of less than one year residual maturity, which do not have matching maturities with the underlying exposures, will not be recognised. The credit protection provided by collateral, on-balance sheet netting, guarantees and credit derivatives will be adjusted in the following manner.⁴⁷

$$Pa = P \times t/T$$

Where:

Pa = value of the credit protection adjusted for maturity mismatch

P = credit protection (e.g. collateral amount, guarantee amount) adjusted for any haircuts

t = the residual maturity of the credit protection arrangement

T = the residual maturity of the exposure ($t \leq T$), $T = \min(5, \text{residual maturity})$

7. Other items related to the treatment of CRM techniques

(i) *Treatment of pools of CRM techniques*

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

(ii) *First-to-default credit derivatives*

170. There are cases where a bank obtains credit protection for a basket of reference names and where the first default among the reference names triggers the credit protection. The credit event also terminates the contract. In this case, the bank may recognise regulatory capital relief for the asset within the basket with the lowest risk weighted amount,

⁴⁷ This framework if presented in the form of risk weights can be presented in the following manner.

The adjusted risk weight for maturity-mismatched exposures will be as follows:

for t less than 1 year, $r^{**} = r$

for t over 1 year, $r^{**} = \left(1 - \frac{t}{T}\right)xr + \left(\frac{t}{T}\right)xr^*$

where: r^{**} is the risk weight of the mismatched position;

r is the risk weight on the unhedged position;

r^* is the risk weight if the position had been hedged without a maturity mismatch;

t is the residual maturity of the hedge; and

T is the residual maturity of the exposure ($t \leq T$).

In the case of collateralised transactions, $r^* = r \times (E^*/E)$

but only if the notional amount is less than or equal to the notional amount of the credit derivative.

171. With regard to the bank providing credit protection through such an instrument, if the product has an external credit assessment from an eligible credit assessment institution, the risk weight in paragraph 518 applied to securitisation tranches will be applied. If the product is not rated by an eligible external credit assessment institution, the risk weights of the assets included in the basket will be aggregated and multiplied by the nominal amount of the protection provided by the credit derivative to obtain the risk weighted asset amount.

(iii) Second-to-default credit derivatives

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

173. For banks providing credit protection through such a product, the capital treatment is basically the same as in paragraph 171 above. The difference will be that in aggregating the risk weights, the asset with the lowest risk weighted amount can be excluded from the calculation.

III. Credit Risk - The Internal Ratings Based Approach

A. Overview

174. This section of the New Accord describes the internal ratings-based (IRB) approach to credit risk. Subject to certain minimum conditions and disclosure requirements, banks that qualify for the IRB approach may rely on their own internal estimates of risk components in determining the capital requirement for a given exposure. The risk components include measures of the probability of default (PD), loss given default (LGD), the exposure at default (EAD), and effective maturity (M). In some cases, banks may be required to use a supervisory value as opposed to an internal estimate for one or more of the risk components.

175. In this section, the asset classes are defined first. Adoption of the IRB approach across all asset classes is also discussed early in this section, as are transitional arrangements. The risk components, each of which is defined later in this section, serve as inputs to the risk weight functions that have been developed for separate asset classes. For example, there is a risk weight function for corporate exposures and another for qualifying revolving exposures. The treatment of each asset class begins with presentation of the relevant risk weight function(s) followed by the risk components and other relevant factors, such as the treatment of credit risk mitigants. The minimum requirements that banks must satisfy to use the IRB approach are presented at the end of this section of the QIS Technical Guidance, starting at paragraph 334.

B. Mechanics of the IRB Approach

176. In Section 1 of Part B, the risk components (e.g. PD, LGD) and asset classes (e.g. corporate exposures and retail exposures) of the IRB approach are defined. Section 2 provides a snap shot of the risk components to be used by banks by asset class. Sections 3 and 4 discuss a bank's adoption of the IRB approach and transitional arrangements, respectively.

1. Categorisation of exposures

177. Under the internal ratings-based (IRB) approach, banks must categorise banking-book exposures into broad classes of assets with different underlying risk characteristics, subject to the definitions set out below. The classes of assets are (a) corporate, (b) sovereign, (c) bank, (d) retail, and (e) equity. Within the corporate asset class, five sub-classes of specialised lending are separately identified. Within the retail asset class, three sub-classes are separately identified. Within the corporate and retail asset classes, a distinct treatment for purchased receivables may also apply provided certain conditions are met.

178. The classification of exposures in this way is broadly consistent with established bank practice. However, some banks may use different definitions in their internal risk management and measurement systems. While it is not the intention of the Committee to require banks to change the way in which they manage their business and risks, banks will be required to apply the appropriate treatment to each exposure for the purposes of deriving their minimum capital requirement. Banks must demonstrate to supervisors that their methodology for assigning exposures to different classes is appropriate and consistent over time.

179. For a discussion of the IRB treatment of asset securitisations, see section IV Credit risk - Securitisation framework.

(i) Definition of corporate exposures

180. In general, a corporate exposure is defined as a debt obligation of a corporation, partnership, or proprietorship. banks will be permitted to separately distinguish loans to small- and medium-sized enterprises (SME), as defined in paragraph 236. Within the corporate asset class, five sub-classes of specialised lending (SL) are identified. Such lending possesses all the following characteristics, either in legal form or economic substance:

- The loan is to an entity (often a special purpose entity (SPE)) which was created specifically to finance and/or operate physical assets;
- The borrowing entity has little or no other material assets or activities, and therefore little or no independent capacity to repay the loan, apart from the income that it receives from the asset(s) being financed;
- The terms of the loan 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 loan is the income generated by the asset(s), rather than the independent capacity of a broader commercial enterprise.

181. The five sub-classes 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

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

183. In such transactions, the lender is usually paid solely or almost exclusively out of the money generated by the contracts for the facility's output, such as the electricity sold by a power plant. The borrower is usually a special-purpose entity (e.g. a corporation, limited partnership, or other legal form) that is not permitted to perform any function other than developing, owning, and operating the installation. The consequence is that repayment depends primarily on the project's cash flow and on the collateral value of the project's assets. In contrast, if repayment of the loan depends primarily on a well established, diversified, credit-worthy, contractually obligated end user for repayment, it is considered a secured exposure to that end-user.

Object Finance

184. Object finance (OF) refers to a method of funding the acquisition of physical assets (e.g. ships, aircraft, satellites, railcars, and fleets) where the repayment of the loan is dependent on the cash flows generated by the specific assets that have been financed and pledged or assigned to the lender. A primary source of these cash flows might be rental or lease contracts with one or several third parties. In contrast, if the loan 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

185. 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 loan will be repaid from the proceeds of the sale of the commodity and the borrower has no independent capacity to repay the loan. This is the case when the borrower has no other activities and no other material assets on its balance sheet. The structured nature of the financing is designed to compensate for the weak credit quality of the borrower. The exposure's rating reflects its self-liquidating nature and the lender's skill in structuring the transaction rather than the credit quality of the borrower.

186. The Committee believes that such lending can be distinguished from loans financing the reserves, inventories, or receivables of other more diversified corporate borrowers. Banks are able to rate the credit quality of the latter type of borrowers based on their broader ongoing operations. In such cases, the value of the commodity serves as a risk mitigant rather than as the primary source of repayment.

Income-producing Real Estate

187. Income-producing real estate (IPRE) refers to a method of providing funding to real estate (such as, office buildings to let, retail space, multifamily residential buildings, industrial or warehouse space, and hotels) where the prospects for repayment and recovery on the loan 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 loans that are collateralised by real estate is the strong positive correlation between the prospects for repayment of the loan 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

188. High-volatility commercial real estate (HVCRE) lending is the financing of commercial real estate that exhibits higher loss rate volatility compared to other types of SL. HVCRE includes:

- Commercial real estate exposures secured by properties of types that are categorised by the national supervisor as sharing higher volatilities in portfolio default rates;
- Loans financing any of the land acquisition, development and construction (ADC) phases for properties of those types in such jurisdictions; and
- Loans financing ADC of any other properties where the source of repayment at origination of the exposure is either the future uncertain sale of the property or cash flows whose source of repayment is substantially uncertain (e.g. the property has not yet been leased to the occupancy rate prevailing in that geographic market for that type of commercial real estate), unless the borrower has substantial equity at risk.

189. Where supervisors categorise certain types of commercial real estate exposures as high-volatility CRE in their jurisdictions, they will be required to make public such determinations. Other supervisors will need to ensure that such treatment is then applied equally to banks under their supervision when making such high-volatility CRE loans in that jurisdiction.

(ii) Definition of sovereign exposures

190. This asset class covers all exposures treated as sovereigns under the standardised approach. This includes sovereigns (and their central banks), certain PSEs identified as sovereigns in the standardised approach, MDBs that meet the criteria for a 0% risk weight under the standardised approach, and the entities referred to in paragraph 30.

(iii) Definition of bank exposures

191. This asset class covers exposures to banks and some securities firms.⁴⁸ Bank exposures also include claims on domestic PSEs that are treated like claims on banks under the standardised approach, and Multilateral Development Banks (MDBs) that do not meet the criteria for a 0% risk weight under the standardised approach.

(iv) Definition of retail exposures

192. An exposure is categorised as a retail exposure if it meets all of the following criteria:

(a) Nature of borrower or low value of individual exposures

- Loans to individuals – such as, revolving credits and lines of credit (e.g. credit cards, overdrafts, and retail facilities secured by financial instruments) as well as personal term loans and leases (e.g. instalment loans, auto loans and leases, student and educational loans, personal finance, and other exposures with similar

⁴⁸ Claims on securities firms may be treated as claims on banks provided the former are subject to supervisory and regulatory arrangements comparable to those under the New Basel Accord (including, in particular, risk-based capital requirements).

characteristics) – are generally eligible for retail treatment regardless of exposure size, although supervisors may wish to establish exposure thresholds to distinguish between retail and corporate exposures.

- Residential mortgage loans (including first and subsequent liens, term loans and revolving home equity lines of credit) are eligible for retail treatment regardless of exposure size so long as the credit is extended to an individual that is an owner-occupier of the property (with the understanding that supervisors will exercise reasonable flexibility regarding buildings containing only a few rental units - otherwise they will be treated as corporate). Loans secured by a single or small number of condominium or co-operative housing units in a single building or complex also fall within the scope of the residential mortgage category. National supervisors may set limits on the maximum number of housing units per exposure.
- Loans extended to small businesses and managed as retail exposures are eligible for retail treatment provided the total exposure of the banking group to an individual small business is less than €1 million. Small business loans extended through or guaranteed by an individual are subject to the same exposure threshold.
- It is expected that supervisors will provide flexibility in the practical application of such thresholds such that banks are not forced to develop extensive new information systems simply for the purpose of ensuring perfect compliance. It will, however, be important for supervisors to ensure that such flexibility (and the exposure amounts in excess of the thresholds that are not treated as violations) is not being abused.

(b) Large number of exposures

193. The exposure must be one of a large pool of loans, which are managed by the bank on a pooled basis. Supervisors may choose to set a minimum number of exposures within a pool for exposures in that pool to be treated as retail.

- Small business exposures below €1 million may be treated as retail exposures if the bank treats such exposures in its internal risk management systems consistently over time and in the same manner as other retail exposures. This requires that such an exposure be originated in a similar manner to other retail exposures. Furthermore, it must not be managed individually in a way comparable to corporate exposures, but rather as part of a portfolio segment or pool of loans with similar risk characteristics for purposes of risk assessment and quantification. However, this does not preclude retail exposures from being treated individually at some stages of the risk management process. The fact that an exposure is rated individually does not by itself deny the eligibility as a retail exposure.

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

(v) Qualifying revolving exposures

195. The following criteria must be satisfied for a sub-portfolio to be treated as a qualifying revolving exposure. These criteria must be applied at a sub-portfolio level consistent with the bank's segmentation of its retail activities generally. Segmentation at the national or country level (or below) should be the general rule. To be eligible for treatment as a qualifying revolving exposure, all of the following criteria must be satisfied.

- (a) The exposures are revolving, unsecured, and uncommitted (both contractually and in practice). In this context, revolving exposures are defined as those where

customers' outstanding balances are permitted to fluctuate based on their decisions to borrow and repay, up to a limit established by the bank.

- (b) The exposures are to individuals.
- (c) The maximum exposure to a single individual in the sub-portfolio is \$100,000 or less.
- (d) The bank can demonstrate that the sub-portfolio exhibits a high ratio of future margin income (FMI) to expected loss. In general, FMI should cover the sum of expected losses and two standard deviations of the annualised loss rate on the sub-portfolio. This target is not expected to be used as a hard limit that would lead to ineligibility in the case of small or transient deviations. Some supervisors may apply this criterion by disallowing a portion of FMI recognition (i.e. increasing the EL component of the capital requirement) in line with shortfalls in meeting this condition.

Data used to support this criterion should meet the standards established for the retail IRB approach generally. In addition, supervisors should seek to ensure that the data are not being distorted due to, for example, the choice of assets being securitised relative to those retained on-balance-sheet.

- (e) Data on loss rates and margin income for the sub-portfolio must be retained in order to allow analysis of the volatility of loss rates.
- (f) The supervisor must concur that treatment as a qualifying revolving exposure is consistent with the underlying risk characteristics of the sub-portfolio.

196. For these purposes, future margin income (FMI) is defined as the amount of income anticipated to be generated by the relevant exposures over the next twelve months that can reasonably be assumed to be available to cover potential credit losses on the exposures (i.e. after covering normal business expenses). FMI must not include income anticipated from new accounts. Assumptions regarding changes in expected levels of balances (and therefore income) on existing accounts must be in line with historical experience, considering also the potential impact of anticipated business conditions.

(vi) *Definition of equity exposures*

197. In general, equity exposures are defined on the basis of the economic substance of the instrument. They include both direct and indirect ownership interests,⁴⁹ whether voting or non-voting, in the assets and income of a commercial enterprise or of a financial institution that is not consolidated or deducted pursuant to the Scope of Application of the New Accord.⁵⁰ An instrument is considered to be an equity exposure if it meets all of the following requirements:

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

⁴⁹ 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.

⁵⁰ Where some G10 countries retain their existing treatment as an exception to the deduction approach, such equity investments by IRB banks are to be considered eligible for inclusion in their IRB equity portfolios.

198. Additionally any of the following instruments must be also categorised as an equity exposure:

- An instrument with the same structure as those permitted as Tier 1 capital for banking organisations.
- An instrument that embodies an obligation on the part of the issuer and meets any of the following conditions:
 - (1) The issuer may defer indefinitely the settlement of the obligation;
 - (2) The obligation requires (or permits at the issuer's discretion) settlement by issuance of a fixed number of the issuer's equity shares;
 - (3) The obligation requires (or permits at the issuer's discretion) settlement by issuance of a variable number of the issuer's equity shares and (*ceteris paribus*) any change in the value of the obligation is attributable to, equal to, and in the same direction as, the change in the value of a fixed number of the issuer's equity shares;⁵¹ or,
 - (4) The holder has the option to require that the obligation be settled in equity shares, unless either (i) in the case of a traded instrument, the supervisor is content that the bank has demonstrated that the instrument trades more like the debt of the issuer than like its equity, or (ii) in the case of non-traded instruments, the supervisor is content that the bank has demonstrated that the instrument should be treated as a debt position. In cases (i) and (ii), the bank may decompose the risks for regulatory purposes, with the consent of the supervisor.

199. Debt obligations and other securities, partnerships or other vehicles structured with the intent of conveying the economic substance of equity ownership are considered an equity holding.⁵² This includes liabilities from which the return is linked to that of equities.⁵³ Conversely, equity investments that are structured with the intent of conveying the economic substance of debt holdings would not be considered an equity holding.

200. The national supervisor has the discretion to re-characterise debt holdings as equities for regulatory purposes and to otherwise ensure the proper treatment of holdings under Pillar 2 (to be specified in the Third Consultative Document).

⁵¹ For certain obligations that require or permit settlement by issuance of a variable number of the issuer's equity shares, the change in the monetary value of the obligation is equal to the change in the fair value of a fixed number of equity shares multiplied by a specified factor. Those obligations meet the conditions of item 3 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.

⁵² Equities that are recorded as a loan but arise from a debt/equity swap made as part of the orderly realisation or restructuring of the debt are included in the definition of equity holdings. However, these instruments may not attract a lower capital charge than would apply if the holdings remained in the debt portfolio.

⁵³ Supervisors 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.

(vii) *Definition of eligible purchased receivables*

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

(a) *Retail receivables*

202. Purchased retail receivables, provided the purchasing bank complies with the IRB rules for retail exposures, are eligible for the 'top-down' approach as permitted within the existing standards for retail exposures. The bank must also apply the minimum operational requirements as set forth in sections F and H.

(b) *Corporate receivables*

203. In general, for purchased corporate receivables, banks are expected to assess the default risk of individual borrowers as specified in part C, section 1 (starting with paragraph 234) consistent with the treatment of other corporate exposures. However, to use the 'top-down' approach, the purchasing bank's program for corporate receivables must comply with both the criteria for eligible receivables and the minimum operational requirements of this approach.

204. Supervisors may deny the use of the 'top-down' approach for purchased corporate receivables depending on the bank's compliance with minimum requirements. In particular, to be eligible for the proposed 'top-down' treatment, purchased corporate receivables must satisfy the following conditions:

- The receivables are purchased from unrelated, third party sellers, and as such the bank has not originated the receivables either directly or indirectly.
- The receivables must be generated on an arm's-length basis between the seller and the obligor. (As such, intercompany accounts receivable and receivables subject to contra-accounts between firms that buy and sell to each other are ineligible.⁵⁴)
- The purchasing bank has a claim on all proceeds from the pool of receivables or a *pro-rata* interest in the proceeds.⁵⁵
- The remaining maturity of the receivables are not greater than one year, unless they are fully secured by collateral that would be recognised under the IRB approach used for the bank's other corporate exposures.
- National supervisors must also establish concentration limits above which capital charges must be calculated using the minimum requirements for the 'bottom-up' approach for corporate exposures.

205. The existence of full or partial recourse to the seller will not automatically disqualify a bank from adopting this 'top-down' approach, as long as the cash flows from the purchased corporate receivables are the primary protection against default risk as determined by the rules in paragraphs (321 to 324) for purchased receivables and the bank meets the eligibility criteria and operational requirements.

⁵⁴ 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.

⁵⁵ Claims on tranches of the proceeds (first loss position, second loss position etc.) would fall under the securitisation treatment.

2. Foundation and advanced approaches

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

- Risk components - estimates of risk factors provided by banks some of which will be supervisory estimates.
- Risk weight functions - the means by which risk components are transformed into risk weighted assets and therefore capital requirements.
- Minimum requirements - the minimum standards that must be met in order for a bank to use the IRB approach for a given asset class.

207. For many of the asset classes, the Committee has made available two broad approaches: a foundation and an advanced. Under the foundation approach, as a general rule, banks provide their own estimates of some risk components and rely on supervisory estimates for others. Under the advanced approach, banks provide more of their own estimates of PD, LGD and EAD and must provide their own estimates of M, subject to meeting additional minimum standards. In both cases, banks must always use the risk weight functions provided for the purpose of deriving capital requirements.

208. The full suite of approaches is described below:

(i) Corporate, sovereign, and bank exposures

209. Under the foundation approach, banks must provide their own estimates of the probability of default (PD) associated with each of their borrower grades, but must use supervisory estimates for the other relevant risk components. The other risk components are Loss Given Default (LGD), Exposure At Default (EAD) and Maturity (M).⁵⁶

210. Under the advanced approaches, banks may provide their own estimates of PD, LGD and EAD and must provide their own estimates of M.⁵⁷

211. There is an exception to this general rule for the five sub-classes of assets identified as specialised lending (SL).

PF, OF, CF, and IPRE

212. Banks that do not meet the requirements for the estimation of PD under the corporate foundation approach will be required to map their internal risk grades to five supervisory categories, each of which is associated with a specific risk weight. This version of a foundation approach is termed the ‘supervisory slotting criteria approach.’

213. Banks that meet the requirements for the estimation of PD will be able to use the foundation approach to corporate exposures to derive risk weights for these exposures.

⁵⁶ As noted in paragraph 279, some supervisors may require banks using the foundation approach to provide their own estimates of M using the definition provides in paragraphs 281 to 284.

⁵⁷ At the discretion of the national supervisor, certain domestic exposures may be exempt from this (see paragraphs 282 and 283.)

214. Banks that meet the requirements for the estimation of PD and LGD and EAD will be able to use the advanced approach to corporate exposures to derive risk weights for these exposures.

HVCRE

215. There is only one approach for HVCRE. Banks must map their internal risk grades to five supervisory categories, each of which is associated with a specific risk weight. In contrast to the other categories of SL, banks are not permitted to use the corporate foundation or advanced approaches for these exposures.

(ii) Retail exposures

216. For retail exposures, banks must provide their own estimates of PD, LGD and EAD. There is no distinction between a foundation and advanced approach for this asset class.

(iii) Equity exposures

217. There are two broad approaches to calculate risk weighted assets for equity exposures not held in the trading book: a market-based approach and a PD/LGD approach. These are set out in full in paragraphs 300 to 317.

218. The PD/LGD approach to equity exposures will remain available for banks that adopt the advanced approach for other exposure types.

(iv) Eligible purchased receivables

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

3. Adoption of the IRB approach across all asset classes

220. Once a bank adopts an IRB approach for part of its holdings, it is expected to extend it across the entire banking group. The Basel Committee recognises however, that, for many banks, it may not be practicable for various reasons to implement the IRB approach across all material asset classes and business units at the same time. Furthermore, once on IRB, data limitations may mean that banks can meet the standards for the use of own estimates of LGD and EAD for some but not all of their asset classes/business units at the same time.

221. As such, supervisors may allow banks to adopt a phased rollout of the IRB approach across the banking group. The phased rollout includes (a) adoption of IRB across asset classes within the same business unit; (b) adoption of IRB across business units in the same banking group; and (c) move from the foundation approach to the advanced approach for certain risk components. However, when a bank adopts an IRB approach for an asset class within a particular business unit, it must apply the IRB approach to all exposures within that asset class in that unit.

222. A bank must produce an implementation plan, specifying to what extent and when it intends to roll out IRB approaches across significant asset classes and business units over time. The plan should be exacting, yet realistic, and must be agreed with the supervisor. It should be driven by the practicality and feasibility of moving to the more advanced approaches, and not motivated by a desire to adopt a Pillar 1 approach that minimises its capital charge. During the roll-out period, supervisors will ensure that no capital relief is

granted for intra-group transactions which are designed to reduce a banking group's aggregate capital charge by transferring credit risk among entities on the standardised approach, foundation and advanced IRB approaches. This includes, but is not limited to, asset sales or cross guarantees.

223. Some exposures in non-significant business units as well as asset classes that are immaterial in terms of size and perceived risk profile may be exempt from the requirements in the previous two paragraphs, subject to supervisory approval. Capital requirements for such operations will be determined according to the standardised approach, with the national supervisor determining whether a bank should hold more capital under Pillar 2 for such positions.

224. Notwithstanding the above, once a bank has adopted the IRB approach for all or part of any of the corporate, bank, sovereign, or retail asset classes, it will be required to adopt the IRB approach for its equity exposures at the same time, subject to materiality. Supervisors may require a bank to employ one of the IRB equity approaches if its equity exposures are a significant part of the bank's business, even though the bank may not employ an IRB approach in other business lines. Further, once a bank has adopted the general IRB approach for corporate exposures, it will be required to adopt the IRB approach for the SL sub-classes within the corporate exposure class.

225. Banks adopting an IRB approach are expected to continue to employ an IRB approach. A voluntary return to the standardised or foundation approach is permitted only in extraordinary circumstances, such as divestiture of a large fraction of the bank's credit-related business, and must be approved by the supervisor.

226. Given the data limitations associated with SL exposures, a bank may remain on the foundation approach for one or more of its PF, OF, CF or IPRE exposures, and move to the advanced approach for other product lines within the corporate asset class.

4. Transition arrangements

(i) Parallel calculation for banks adopting the advanced approach

227. Banks adopting the foundation and advanced approaches will be required to calculate their capital requirement using these approaches, as well as the existing Accord for a year prior to implementation of the New Accord at year-end 2006.

(ii) Corporate, sovereign, bank, and retail exposures

228. The transition period starts on the date of implementation of the Accord and will last for a period of 3 years from that date. During the transition period, the following minimum requirements can be relaxed, subject to discretion of the national supervisor:

- For corporate, sovereign, and bank exposures under the foundation approach, paragraph 410, the requirement that, regardless of the data source, banks must use at least five years of data to estimate the probability of default (PD); and
- For retail exposures, paragraph 413, the requirement that regardless of the data source banks must use at least five years of data to estimate loss characteristics (EAD, and either expected loss (EL) or PD and LGD).
- For corporate, sovereign, bank, and retail exposures, paragraph 392, the requirement that a bank must demonstrate it has been using a rating system that was broadly in line with the minimum requirements articulated in this document for at least three years prior to qualification.

- The applicable aforementioned transitional arrangements also apply to the PD/LGD approach to equity.

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

(iii) *Equity exposures*

230. For a maximum of ten years, supervisors may exempt from the IRB treatment particular equity investments held at the time of the publication of the New Accord.⁵⁸ The exempted position is measured as the number of shares as of that date and any additional arising directly as a result of owning those holdings, as long as they do not increase the proportional share of ownership in a portfolio company.

231. If an acquisition increases the proportional share of ownership in a specific holding (e.g. due to a change of ownership initiated by the investing company subsequent to the publication of the accord) the exceeding part of the holding will not be subject to the exemption. Nor will the exemption apply to holdings that were originally subject to the exemption, but have been sold and then bought back.

232. Equity holdings covered by these transitional provisions will be subject to the capital requirements of the standardised approach.

C. Rules for Corporate, Sovereign, and Bank Exposures

233. Part C presents the method of calculating capital requirements for corporate, sovereign and bank exposures. As discussed in Section 1 of Part C, one risk weight function is provided for determining the capital requirement for all three asset classes with one exception. A set of supervisory risk weights is provided for certain types of specialised lending: a sub-set of the corporate asset class. Section 2 discusses the risk components.

1. *Risk-weighted assets for corporate, sovereign, and bank exposures*

(i) *Formula for derivation of risk weights*

234. The derivation of risk weights is dependent on estimates of the PD, LGD, EAD and, in some cases, maturity (M), for a given exposure. Paragraphs 279 to 284 discuss the circumstances in which the maturity adjustment applies.

235. Throughout this section, PD, LGD, and EAD are expressed as whole numbers rather than decimals, except where explicitly noted otherwise. For example, LGD of 100% would be input as 100. The exception is in the context of the capital requirement (K) and the maturity adjustment (b).⁵⁹

⁵⁸ This exemption does not apply to investments in entities where some countries will retain the existing risk weighting treatment, as referred to in the Scope of Application section of the New Accord, see footnote 5.

⁵⁹ $N(x)$ denotes the cumulative distribution function for a standard normal random variable (i.e. the probability that a normal random variable with mean zero and variance of one is less than or equal to x). $G(z)$ denotes the inverse cumulative distribution function for a standard normal random variable (i.e. the value of x such that $N(x) = z$). The normal cumulative distribution function and the inverse of the normal cumulative distribution function are available in Excel as the functions NORMSDIST and NORMSINV.

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

$$\text{Maturity adjustment (b)} = (0.08451 - 0.05898 \times \log(\text{PD}))^2$$

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

$$\text{Risk-weighted assets (RW)} = \text{K} \times 12.50 \times \text{EAD}$$

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

236. Under the IRB approach for corporate credits, banks will be permitted to separately distinguish loans to SME borrowers (defined as corporate exposures where the reported sales for the consolidated group of which the firm is a part is less than €50 million) from those to large firms. A firm-size adjustment (i.e. $0.04 \times 1 - ((S-5)/45)$) is made to the corporate risk weight formula for loans to SME borrowers. S is expressed as total annual sales in millions of Euros with values of S falling in the range of equal to or less than €50 million or greater than or equal to €5 million. Reported sales of less than €5 million will be treated as if they were equivalent to €5 million for the purposes of the firm-size adjustment for SME borrowers.

$$\text{Correlation (R)} = \frac{0.12 \times (1 - \text{EXP}(-50 \times \text{PD}))}{(1 - \text{EXP}(-50))} + \frac{0.24 \times [1 - (1 - \text{EXP}(-50 \times \text{PD}))]}{(1 - \text{EXP}(-50))} - 0.04 \times (1 - (S-5)/45)$$

237. Subject to national discretion, supervisors may allow banks, as a failsafe, to substitute total assets for total sales in calculating the SME threshold and the firm-size adjustment. Total assets should be used only when total sales are not a meaningful indicator of firm size.

(iii) Risk weights for specialised lending

Risk weights for PF, OF, CF, and IPRE

238. Banks that do not meet the requirements for the estimation of PD under the corporate IRB approach will be required to map their internal grades to five supervisory categories, each of which is associated with a specific risk weight. The slotting criteria on which this mapping must be based are provided in annex 4. The risk weights associated with each supervisory category are:

Supervisory categories and risk weights for other SL exposures

Strong	Good	Satisfactory	Weak	Default
75%	100%	150%	350%	625%

239. At national discretion, supervisors may allow banks to assign a preferential risk weight of 50% to “strong” SL exposures, and a 75% risk weight to “good” SL exposures, provided they have an original maturity of less than 2.5 years.

240. Banks that meet the requirements for the estimation of PD will be able to use the general foundation approach for the corporate asset class to derive risk weights for SL sub-classes.

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

Risk weights for HVCRE

242. For such exposures, a bank must map its internal grades to five supervisory categories, each of which is associated with a specific risk weight. The slotting criteria on which this mapping must be based are the same as those for IPRE, as provided in Annex 4. The risk weights associated with each category are:

Supervisory categories and risk weights for high-volatility commercial real estate

Strong	Good	Satisfactory	Weak	Default
100%	125%	175%	350%	625%

243. Banks are not permitted to use the corporate foundation or advanced approaches for HVCRE exposures.

2. Risk Components

(i) Probability of Default (PD)

244. For corporate or bank exposures, the PD is the greater of the one-year PD associated with the internal borrower grade to which that exposure is assigned, or 0.03%. For sovereign exposures, the PD is the one-year PD associated with the internal borrower grade to which that exposure is assigned. The PD of borrowers assigned to a default grade(s), consistent with the reference definition of default, is 100%. The minimum requirements for the derivation of the PD estimates associated with each internal borrower grade are outlined in paragraphs 408 to 410.

(ii) Loss Given Default (LGD)

245. A bank must provide an estimate of the loss given default (LGD) for each corporate, sovereign and bank exposure. There are two approaches for deriving this estimate: a foundation approach and an advanced approach.

LGD under the foundation approach

Treatment of unsecured claims and non-recognised collateral

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

247. Subordinated claims on corporates, sovereigns and banks without specifically recognised collateral will be assigned a 75% LGD. A subordinated loan is a facility that is

expressly subordinated to another facility. At national discretion, supervisors may choose to employ a wider definition of subordination. This might include economic subordination, such as cases where the facility is unsecured and the bulk of the borrower's assets are used to secure other loans.

Eligible collateral under the foundation approach

248. In addition to the eligible collateral recognised in the standardised approach (hereafter referred to as eligible financial collateral) there is specified other eligible collateral (hereafter referred to as other eligible IRB collateral) under the foundation IRB approach. These include receivables, specified residential and commercial real estate (CRE/RRE), and other collateral, as defined below.

249. Before a bank may recognise the effect of collateral on LGD, it must demonstrate adherence to a number of minimum requirements. For eligible financial collateral, the requirements are identical to the operational standards as set out in section II B beginning with paragraph 73. In respect of other eligible IRB collateral, the minimum requirements are articulated in paragraphs 469 and 470.

Methodology for recognition of financial collateral under the foundation approach

250. The methodology for the recognition of eligible financial collateral closely follows that outlined in the 'comprehensive approach' to collateral in the standardised approach outlined in paragraphs 110 to 113. The 'simple approach' to collateral presented in the standardised approach will not be available to banks applying the IRB approach.

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

- LGD is that of the unsecured exposure before recognition of collateral (either 45% or 75%, as above);
- E is the nominal exposure amount (i.e. cash lent or securities lent or posted);
- E* is the exposure value after the recognition of credit risk mitigants as determined in paragraphs 110 to 113 of the standardised approach. This concept is only used to calculate LGD*. Banks must continue to calculate EAD without taking into account the presence of any collateral, unless otherwise specified.

$$\text{LGD}^* = \text{Max} \{0, \text{LGD} \times [(E^* / E)]\}$$

252. Banks that qualify for the foundation IRB approach may calculate E* using any of the ways specified under the comprehensive approach for collateralised transactions under the standardised approach.

253. Where repo-style transactions are subject to a master netting agreement, a bank may choose not to recognise the netting effects in calculating capital. Banks that want to recognise the effect of master netting agreements on such transactions for capital purposes must satisfy the criteria provided in paragraph 136 to 140 of the standardised approach. The bank must calculate E* and recognise this amount through an adjustment to EAD. The impact of collateral on these transactions may not be reflected through an adjustment to LGD.

Carve out from the comprehensive approach

254. As in the standardised approach, for transactions where the conditions in paragraph 133 are met, and in addition, the counterparty is a core market participant as specified in paragraph 134, supervisors may choose not to apply the haircuts specified under the comprehensive approach, but instead to apply a zero H.

Other eligible IRB collateral under the foundation approach

255. In addition to the eligible financial collateral specified above, banks under the foundation IRB approach may obtain capital relief from collateral in the form of commercial and residential real estate (CRE/RRE), receivables and other collateral under the foundation approach if such collateral meets the minimum requirements set out in paragraphs 455 to 458.⁶⁰

Methodology for recognition of other eligible IRB collateral

256. The methodology for determining the effective LGD under the foundation approach for cases where banks have taken other eligible IRB collateral to secure a corporate exposure is as follows.

- Exposures where the minimum eligibility requirements are met, but the ratio of current collateral value (C) to the nominal exposure (E) is below a threshold level of C* (i.e. the required minimum collateralisation level for the exposure) would receive the appropriate LGD for unsecured exposures or those secured by non-recognised collateral.⁶¹
- Exposures where the ratio of collateral value (C) to the nominal exposure (E) exceeds a second, higher threshold level of C** (i.e. the required level of over-collateralisation to receive full LGD recognition) would be assigned an LGD according to the following table.
- The following table displays the applicable LGD and required over-collateralisation levels for the secured parts of senior exposures:

⁶⁰ The Committee, however, recognises that, in exceptional circumstances for well-developed and long-established markets, mortgages on office and/or multi-purpose commercial premises and/or multi-tenanted commercial premises may have the potential to receive alternative recognition as collateral in the corporate portfolio. Please refer to footnote 18 of paragraph 45 for a discussion of the eligibility criteria that would apply. The LGD applied to the collateralised portion of such exposures, subject to the limitations set out in paragraphs 82 to 144 of the standardised approach, will be set at 35%. The LGD applied to the remaining portion of this exposure will be set at 45%. In order to ensure consistency with the capital charges in the standardised approach (while providing a small capital incentive in the IRB approach relative to the standardised approach), supervisors may apply a cap on the capital charge associated with such exposures so as to achieve comparable treatment in both approaches.

⁶¹ For subordinated exposures (as defined in paragraph 247) secured by collateral that meet the eligibility requirements, the effective LGD would be based on the LGD of the subordinated loan (i.e. 75%). This treatment would also apply in the calculation of effective LGD under pools of collateral.

Minimum LGD for secured portion of senior exposures

	<i>Minimum LGD</i>	<i>Minimum degree of collateralisation of the exposure (C*)</i>	<i>Degree of over-collateralisation for full LGD recognition (C**)</i>
Financial collateral	0%	0%	n.a.
Receivables	35%	0%	125%
CRE/RRE	35%	30%	140%
Other collateral ⁶²	40%	30%	140%

- The part of the exposure considered to be fully collateralised, that is the collateralised exposure amount over the required degree of over-collateralisation (C/C**), receives the LGD associated with the type of collateral.
- The remaining part of the exposure is regarded as unsecured and receives an LGD of 45% or 75%, respectively, depending upon whether it is senior or subordinated.

Methodology for the treatment of pools of collateral

257. The methodology for determining the effective LGD of a transaction under the foundation approach where banks have taken both financial collateral and other eligible IRB collateral is aligned to the treatment in the standardised approach and based on the following guidance.

- In the case where a bank has obtained multiple credit risk mitigation techniques, it will be required to subdivide the adjusted value of the exposure (after the haircut for financial collateral) into portions each covered by only one CRM type. That is, the bank must divide the exposure into the portion covered by financial collateral, the portion covered by receivables, the portion covered by CRE/RRE collateral, a portion covered by other eligible collateral, and an unsecured portion, where relevant.
- Where the ratio of the sum of the value of other collateral to the reduced exposure (after recognising the effect of financial and receivables collateral) is below the associated threshold level (i.e. the minimum degree of collateralisation of the exposure), the exposure would receive the appropriate unsecured LGD value: 45% or 75%, respectively, depending upon whether the exposure is senior or subordinated.
- The risk weighted assets for each fully secured portion of exposure must be calculated separately.

LGD under the advanced approach

258. Subject to certain additional minimum requirements specified below, supervisors may permit banks to use their own internal estimates of LGD for corporate, sovereign and bank exposures. LGD must be measured as the loss given default as a percentage of the

⁶² Other collateral excludes physical assets acquired by the bank as a result of a loan default.

exposure at default. Banks eligible for the IRB approach that are unable to meet these additional minimum requirements must utilise the foundation LGD treatment described above.

259. The minimum requirements for the derivation of LGD estimates are outlined in paragraphs 415 to 420.

Treatment of certain repo-style transactions

260. Banks that want to recognise the effects of master netting agreements on repo-style transactions for capital purposes must apply the methodology outlined in paragraph 253 for determining E* and capturing it in the EAD estimate. For banks using the advanced approach, own LGD estimates would be permitted for the unsecured amounts.

Treatment of guarantees and credit derivatives

261. There are two approaches for recognition of credit risk mitigation in the form of guarantees and credit derivatives in the IRB approach: a foundation approach for banks using supervisory values of LGD, and an advanced approach for those banks using their own internal estimates of LGD.

262. Under either approach, credit risk mitigation in the form of guarantees and credit derivatives must not reflect the effect of double default. As such, to the extent that the credit risk mitigation is recognised by the bank, the adjusted risk weight will not be less than that of a comparable direct exposure to the protection provider.

Recognition under the foundation approach

263. For banks using the foundation approach for LGD, the approach to guarantees and credit derivatives closely follows the treatment under the standardised approach as specified in paragraphs 154 to 165. The range of eligible guarantors is the same as under the standardised approach. Unrated companies that are internally rated and associated with a PD equivalent to A- or better may also be recognised. To receive recognition, the bank must meet the requirements outlined in paragraphs 154 to 157 and 437.

264. Eligible guarantees from eligible guarantors will be recognised as follows:

- For the covered portion of the exposure, a risk weight is derived by taking:
- the risk weight function appropriate to the type of guarantor, and
- the PD appropriate to the guarantor's borrower grade, or some grade between the underlying obligor and the guarantor's borrower grade if the bank deems a full substitution treatment not to be warranted.
- The bank may replace the LGD of the underlying transaction with that of the guarantee.⁶³

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

⁶³ In most cases these will be identical, as the foundation LGDs for unsecured exposures across corporate, sovereign, and bank counterparties is 45%. A lower LGD may be substituted when the underlying exposure is subordinated or when the guarantee is supported by eligible collateral.

266. Where partial coverage exists, or where there is a currency mismatch between the underlying obligation and the credit protection, it is necessary to split the exposure into a covered and uncovered amount. The treatment in the foundation approach follows that outlined in the standardised approach, and depends upon whether the cover is proportional or tranching.

Recognition under the advanced approach

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

268. A bank relying on own-estimates of LGD has the option to adopt the treatment outlined above for banks under the foundation IRB approach (paragraphs 262 to 266), or to make an adjustment to its LGD estimate of the exposure to reflect the presence of the guarantee. Under this option, there are no limits to the range of eligible guarantors although the set of minimum requirements provided in paragraph 431 concerning the type of guarantee must be satisfied.

(iii) Exposure at Default (EAD)

269. The following sections apply to both on and off-balance sheet positions. All exposures are measured as the amount legally owed to the bank, i.e. gross of specific provisions or partial write-offs. This rule also applies to assets purchased at a price different than the amount legally owed. For purchased assets, the difference between the exposure and the net value recorded on the balance-sheet of the bank is denoted discount if the exposure is larger, and premium if the exposure is smaller.

Exposure measurement for on-balance sheet items

270. On-balance sheet netting of loans and deposits of banks to or from a corporate counterparty will be recognised subject to the same conditions as under the standardised approach (see paragraph 153). Where currency or maturity mismatched on-balance sheet netting exists, the treatment follows the standardised approach, as set out in paragraphs 164 and 166 to 168.

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

271. For off-balance sheet items, exposure is calculated as the committed but undrawn line multiplied by a credit conversion factor (CCF). There are two approaches for the estimation of CCFs: a foundation approach and an advanced approach.

EAD under the foundation approach

272. The types of instruments and the credit conversion factors applied to them remain the same as those in the standardised approach, as outlined in paragraphs 49 to 51 with the exception of commitments, Note Issuance Facilities (NIFs) and Revolving Underwriting Facilities (RUFs), and short-term trade letters of credit.

273. A credit conversion factor of 75% will be applied to commitments, NIFs and RUFs regardless of the maturity of the underlying facility. This does not apply to those facilities which are uncommitted, that are unconditionally cancellable, or that effectively provide for

automatic cancellation, for example due to deterioration in a borrower's creditworthiness, at any time by the bank without prior notice. A credit conversion factor of 0% will be applied to these facilities.

274. The amount to which the CCF is applied is the lower of the value of the unused committed credit line, and the value that reflects any possible constraining availability of the facility, such as the existence of a ceiling on the potential lending amount which is related to a borrower's reported cash flow. If the facility is constrained in this way, the bank must have sufficient line monitoring and management procedures to support this contention.

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

276. For short-term self-liquidating trade letters of credit arising from the movement of goods (e.g. documentary credits collateralised by the underlying shipments), a 50% credit conversion factor will be applied for both issuing and confirming banks.

EAD under the advanced approach

277. Banks which meet the minimum requirements for use of their own estimates of exposure (see paragraphs 421 to 426) will be allowed to use their own internal estimates of CCFs (typically referred to as exposure at default (EAD) in banks' internal systems) across different product types.

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

278. Measures of exposure for these instruments under the IRB approach will be calculated as per the rules for the calculation of credit equivalent amounts, i.e. based on the replacement cost plus potential future exposure add-ons across the different product types and maturity bands.

(iv) Effective Maturity (M)

279. For banks using the foundation approach for corporate exposures, effective maturity (M) will be 2.5 years. National supervisors may choose to require all banks in their jurisdiction (those using the foundation and advanced approaches) to measure M for each facility using the definition provided below.

280. Banks using any element of the advanced IRB approach are required to measure effective maturity for each facility as defined below (referred to as an explicit maturity adjustment). However, national supervisors may exempt facilities to certain smaller domestic corporate borrowers from the explicit maturity adjustment if the reported sales (i.e. turnover) as well as total assets for the consolidated group of which the firm is a part of are less than €500 million. The consolidated group has to be a domestic company based in the country where the exemption is applied. If adopted, national supervisors must apply such an exemption to all IRB banks using the advanced approach in that country, rather than on a bank-by-bank basis. If the exemption is applied, all exposures to qualifying smaller domestic firms will be assumed to have an average maturity of 2.5 years, as under the foundation IRB approach.

281. Unless noted in paragraph 282, M is defined as the greater of one year and the remaining effective maturity in years as defined below. In all cases, M will be no greater than 5 years.

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

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

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

- If a bank is not in a position to calculate the effective maturity of the contracted payments as noted above, M would equal the maximum remaining time (in years) that the borrower is permitted to take to fully discharge its contractual obligation (principal, interest, and fees) under the terms of loan agreement. Normally, this will correspond to the nominal maturity of the instrument.

282. The one-year floor will not apply for certain short-term exposures, as defined by each supervisor on a national basis. In such cases, the maturity would be calculated as the greater of one-day, and the effective maturity (M, consistent with the definition above). This treatment targets transactions that are not a part of the ongoing term financing of the obligor. These transactions include financial market transactions, and one-off short-term exposures that are transaction oriented. Additionally, in order to be eligible for the carve-out treatment, an exposure must have an original maturity below three months.

283. On a national basis, supervisors are expected to elaborate on short-term exposures that satisfy the criteria provided in the preceding paragraph. The examples include:

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

284. Where there is no explicit adjustment, the effective maturity (M) assigned to all exposures is the same, and is currently set at 2.5 years.

Treatment of maturity mismatches

285. The treatment of maturity mismatches under IRB is identical to that in the standardised approach - see paragraphs 166 to 168.

D. Rules for Retail Exposures

286. Part D presents in detail the method of calculating capital requirements for retail exposures. Section 1 of Part D provides three risk weight functions, one for residential mortgage exposures, a second for qualifying revolving exposures, and a third for other retail exposures. Section 2 presents the risk components to serve as inputs to the risk weight functions.

1. Risk-weighted assets for retail exposures

287. There are three separate risk-weight functions for retail exposures, as defined in paragraphs 288 to 291. Risk weights for retail exposures are based on separate assessments of PD and LGD as inputs to the risk weight functions. It should also be noted that these formulas automatically impose a maximum capital requirement equal to the LGD value. Also, note that none of the three retail risk-weight functions contains an explicit maturity adjustment.⁶⁴ Throughout this section, PD, LGD, and EAD are expressed as whole numbers rather than decimals, except where explicitly noted otherwise. For example, LGD of 100% would be input as 100. The exception is in the context of the capital requirements (K) and the correlation (R).

(i) Residential mortgage exposures

288. For exposures secured or partly secured⁶⁵ by residential mortgages as defined in paragraph 192, risk weights will be assigned based on the following formula:

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

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

$$\text{Risk-weighted assets} = \text{K} \times 12.50 \times \text{EAD}$$

(ii) Qualifying revolving exposures

289. For qualifying revolving exposures as defined in paragraph 195, risk weights will be defined based on the following formula, which allows the correlation input to vary with PD:

$$\text{Correlation (R)} = 0.02 \times (1 - \text{EXP}(-50 \times \text{PD})) / (1 - \text{EXP}(-50)) + 0.15 \times [1 - (1 - \text{EXP}(-50 \times \text{PD})) / (1 - \text{EXP}(-50))]$$

$$\text{Capital requirement (K)} = \text{LGD} \times \text{N}[(1 - \text{R})^{-0.5} \times \text{G}(\text{PD}) + (\text{R} / (1 - \text{R}))^{0.5} \times \text{G}(0.999)] - 0.90 \text{ PD} \times \text{LGD}$$

$$\text{Risk-weighted assets} = \text{K} \times 12.50 \times \text{EAD}$$

290. This function effectively allows 90% of expected losses to be covered by future margin income. As noted in paragraph 195, the criteria for qualifying revolving exposures are generally intended to ensure that FMI will be larger than expected losses plus two standard deviations of the annualised loss rate. Supervisors may apply this criterion by disallowing a

⁶⁴ The effect of average maturity for these exposures is subsumed in the correlation assumption.

⁶⁵ This means that risk weights for residential mortgages also apply to the unsecured portion of such residential mortgages.

portion of FMI recognition (i.e. increasing the EL component of the capital requirement) in line with shortfalls in meeting this condition.⁶⁶

(iii) Other retail exposures

291. For all other retail exposures, risk weights will be assigned based on the following function, which also allows correlation to vary with PD:

$$\text{Correlation (R)} = 0.02 \times (1 - \text{EXP}(-35 \times \text{PD})) / (1 - \text{EXP}(-35)) + 0.17 \times [1 - (1 - \text{EXP}(-35 \times \text{PD})) / (1 - \text{EXP}(-35))]$$

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

$$\text{Risk-weighted assets} = \text{K} \times 12.50 \times \text{EAD}$$

2. Risk components

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

292. For each identified pool of retail exposures, banks are expected to provide an estimate of the PD and LGD associated with the pool, subject to the minimum requirements as set out in section H.

(ii) Recognition of guarantees and credit derivatives

293. Advanced banks may reflect the risk reducing effects of guarantees and credit derivatives, either in support of an individual obligation or a pool of exposures, through an adjustment of either the PD or LGD estimate, subject to the minimum requirements in paragraphs 427 to 436.

294. Consistent with the requirements outlined above for corporate, sovereign, and bank exposures, banks must not include the effect of double default in such adjustments. The adjusted risk weight must not be less than that of a comparable direct exposure to the protection provider.

(iii) Exposure at default (EAD)

295. Both on and off-balance sheet retail exposures are measured as the amount legally owed to the bank, gross of specific provisions or partial write-offs. This rule also applies to assets purchased at a price different than the amount legally owed. For purchased assets, the difference between the exposure and the net value recorded on the balance-sheet of the bank is denoted discount if the exposure is larger, and premium if the exposure is smaller.

296. As with corporate exposure, retail exposure is measured as the nominal outstanding balance for on-balance sheet items. On-balance sheet netting of loans and deposits of a bank to or from a retail customer will be permitted subject to the same conditions as under the standardised approach. For retail off-balance sheet items, banks must use their own estimates of credit conversion factors.

⁶⁶ In such cases, the second line of the formula for the capital requirement becomes ... – min (0.9 * PD * LGD, FMI - 2 * sigma), where sigma is defined as the standard deviation of the annualised loss rate on the sub-portfolio and FMI is the future margin income on the sub-portfolio, as defined in paragraph 195.

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

298. To the extent that foreign exchange and interest rate commitments exist within a bank's retail portfolio for IRB purposes, banks will not be permitted to provide their internal assessments of credit equivalent amounts. Instead, the rules for the standardised approach will continue to apply.

E. Rules for Equity Exposures

299. Part E presents the method of calculating capital requirements for equity exposures. Section 1 of Part E discusses (a) the market-based approach (which is further sub-divided into a simple risk weight method and an internal models method), and (b) the PD/LGD approach. The risk components are provided in Section 2.

1. Risk weighted assets for equity exposures

300. Risk weighted assets for equity exposures in the trading book are subject to the market risk capital rules.

301. There are two approaches to calculate risk weighted assets for equity exposures not held in the trading book: a market-based approach and a PD/LGD approach. Supervisors will decide which approach or approaches will be used by banks, and in what circumstances. Certain equity holdings are excluded (as defined below) and are subject to the capital charges required under the standardised approach.

302. Where supervisors permit both methodologies, banks' choices must be made consistently, and in particular not determined by regulatory arbitrage considerations.

(i) Market-based approach

303. Under the market-based approach, institutions are permitted to calculate the minimum capital requirements for their banking book equity holdings using one or both of two separate and distinct methods: a simple risk weight method or an internal models method. The method used should be consistent with the amount and complexity of the institution's equity holdings and commensurate with the overall size and sophistication of the institution. Supervisors may require the use of either method based on the individual circumstances of an institution.

Simple risk weight method

304. Under the simple risk weight method, a 300% risk weight is to be applied to equity holdings that are publicly traded and a 400% risk weight is to be applied to all other equity holdings. A publicly traded holding is defined as any equity security traded on a recognised security exchange.

305. Short cash positions and derivative instruments held in the banking book are permitted to offset long positions in the same individual stocks provided that these instruments have been explicitly designated as hedges of specific equity holdings and that

they have remaining maturities of at least 1 year. Other short positions are to be treated as if they are long positions with the relevant risk weight applied to the absolute value of each position. In the context of maturity mismatched positions, the methodology is that for corporate exposures.

Internal models method

306. IRB banks may use, or may be required by their supervisor to use, internal risk measurement models to calculate the risk-based capital requirement. Under this alternative, banks must hold capital equal to the potential loss on the institution's equity holdings as derived using internal value-at-risk models subject to the 99th percentile, one-tailed confidence interval of quarterly excess returns over an appropriate risk-free rate computed over a long-term sample period. The capital charge would be incorporated into an institution's risk-based capital ratio through the calculation of risk-weighted equivalent assets.

307. 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 current minimum 8% risk-based capital requirement). Capital charges calculated under the internal model method may be no less than the capital charges that would be calculated under the simple risk weight method using a 200% risk weight for publicly traded equities holdings and a 300% risk weight for all other equity holdings. These minimum capital charges would be calculated separately using the methodology of the simple risk weight approach.

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

(ii) PD/LGD approach

309. The minimum requirements and methodology for the PD/LGD approach for equity exposures (including equity of companies that are included in the retail asset class) are the same as those for the IRB foundation approach for corporate exposures subject to the following specifications:⁶⁷

- The bank's estimate of the PD of a corporate entity in which it holds an equity position must satisfy the same requirements as the bank's estimate of the PD of a corporate entity where the bank holds debt.⁶⁸ If a bank does not hold debt of the company in whose equity it has invested, and does not have sufficient information on the position of that company to be able to use the applicable definition of default in practice but meets the other standards, a 1.5 scaling factor will be applied to the risk weights derived from the corporate curve, given the PD set by the bank. If, however, the bank's equity holdings are material and it is permitted to use a PD/LGD approach for regulatory purposes but the bank has not yet met the relevant standards, the simple risk weight method under the market-based approach will apply.
- An LGD of 90% would be assumed in deriving the risk weight for equity exposures.

⁶⁷ There is no advanced approach for equity exposures, given the 90% LGD assumption.

⁶⁸ 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.

- For these purposes, the risk weight is subject to a five-year maturity adjustment whether or not the bank is using the explicit approach to maturity elsewhere in its IRB portfolio.

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

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

311. For all other equity positions, including net short positions (as defined in paragraph 305), 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 equities holdings and a 300% risk weight for all other equity holdings.

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

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

313. Equity holdings in entities whose debt obligations qualify for a zero risk weight under the standardised approach for credit risk can be excluded from the IRB bank approaches to equity (including those publicly sponsored entities where a zero risk weight can be applied), at the discretion of the national supervisor. If a national supervisor makes such an exclusion this will be available to all banks.

314. To promote specified sectors of the economy, supervisors may exclude from the IRB capital charges equity holdings made under legislated programmes that provide significant subsidies for the investment to the bank and involve some form of government oversight and restrictions on the equity investments. Example of restrictions are limitations on the size and types of businesses in which the bank is investing, allowable amounts of ownership interests, geographical location and other pertinent factors that limit the potential risk of the investment to the bank. This exclusion is limited to an aggregate of 10% of Tier 1 plus Tier 2 capital.

315. Supervisors may also exclude the equity exposures of a bank from the IRB treatment based on materiality. The equity exposures of a bank are considered material if their aggregate value, including holdings subject to exclusions and transitional provisions, exceeds, on average over the prior year, 10% of bank's Tier 1 plus Tier 2 capital. This materiality threshold is lowered to 5% of a bank's Tier 1 plus Tier 2 capital if the equity portfolio consists of less than 10 individual holdings. National supervisors may use lower materiality thresholds.

2. Risk components

316. In general, the measure of an equity exposure on which capital requirements is based is the value presented in the financial statements, which depending on national accounting and regulatory practices may include unrealised revaluation gains. Thus, for example, equity exposure measures will be:

- For investments held at fair value with changes in value flowing directly through income and into regulatory capital, exposure is equal to the fair value presented in the balance sheet.
- For investments held at fair value with changes in value not flowing through income but into a tax-adjusted separate component of equity, exposure is equal to the fair value presented in the balance sheet.
- For investments held at cost or at the lower of cost or market, exposure is equal to the cost or market value presented in the balance sheet.⁶⁹

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

F. Rules for Purchased Receivables

318. Part F presents the method of calculating capital requirements for purchased receivables. For such assets, there are IRB capital charges for both default risk and dilution risk. Section 1 of Part F discusses the calculation of risk weighted assets for default risk. The calculation of risk weighted assets for dilution risk is provided in Section 2.

1. Risk-weighted assets for default risk

(i) Purchased retail receivables

319. For purchased retail receivables, a bank must meet the risk quantification standards for retail exposures. 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. For receivables belonging unambiguously to one asset class, the IRB risk weight for default risk will be based on the risk weight function applicable to that particular exposure type, as long as the bank can meet the full entry standards for this particular risk weight function. For example, if banks cannot comply with the standards for qualifying revolving exposures (defined in paragraph 195), they should use the risk weight function for other retail exposures.

320. For hybrid pools containing mixtures of exposure types, if the purchasing bank cannot separate the exposures by type, the risk-weight function producing the highest capital requirements for those exposure types will apply.

⁶⁹ This does not affect the existing allowance of 45% of unrealised gains to Tier 2 capital in the current Accord.

(ii) *Purchased corporate receivables*

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

- The purchasing bank will estimate the pool's one-year EL for default risk, expressed in percentage of the nominal receivables amount (i.e. the total amount legally owed to the bank by all obligors in the receivables pool).⁷⁰ The estimated EL must be calculated for the receivables on a stand-alone basis; that is, without regard to any assumption of recourse or guarantees from the seller or other parties. The treatment of recourse or guarantees covering default risk (and/or dilution risk) is discussed separately below.
- Given the EL estimate for the pool's default losses, the risk weight for default risk will be determined by the risk weight function for corporate exposures.⁷¹ As described below, the precise calculation of risk weights for default risk will depend on the bank's ability to decompose EL into its PD and LGD components in a reliable manner. However, the advanced approach will not be available for banks that use the foundation approach for corporate exposures.

Foundation IRB Treatment

322. If the purchasing bank is unable to decompose EL into its PD and LGD components in a reliable manner, the risk weight will be determined from the corporate risk-weight function using the following specifications: PD will be the bank's estimates of EL; LGD will be 100%; and EAD will be the nominal amount outstanding. EAD for a revolving purchase facility will be the sum of the current nominal amount of receivables purchased, and 75% of any undrawn purchase commitments.

Advanced IRB Treatment

323. If the purchasing bank can estimate the pool's exposure weighted-average LGD or average PD in a reliable manner, the risk weight for the purchased receivables will be determined using the bank's estimated weighted-average PD and LGD as inputs to the corporate risk-weight function. Similarly to the Foundation IRB treatment, EAD will be the nominal amount outstanding. EAD for a revolving purchase facility will be the sum of the current nominal amount of receivables purchased, and 75% of any undrawn purchase commitments (thus, advanced banks will not be permitted to use their internal EAD estimates for undrawn purchase commitments).

⁷⁰ For example, if the nominal amount of receivables is \$100 and the expected loss is \$5, the EL is 5%, independent of the purchase price. Under this treatment, any purchase discount is reflected in the reduction in the EL charge, rather than the EL estimate itself. Note that treatment above is for a purchase discount that is *not* refundable to the seller. When the purchaser undertakes to pay the seller any amount obtained from the obligor in excess of the amount paid to the seller at purchase the refundable amount can be regarded as cash collateral provided by the seller to protect the purchaser against dilution risk. A refundable purchase discount would therefore imply an LGD of zero and, hence, the exposure that is covered by such collateral would carry a zero capital charge (since IRB risk weights are proportional to LGD).

⁷¹ The firm-size adjustment for SME, as defined in paragraph 236, will be the weighted average by individual exposure of the pool of purchased corporate receivables. If the bank does not have the information to calculate the average size of the pool, the firm-size adjustment will not apply.

324. For drawn amounts M will equal the pool's exposure-weighted average effective maturity (as defined in paragraph 281). 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 bank against a significant deterioration in the quality of the future receivables it is required to purchase over the facility's term. Absent such effective protections, the M for undrawn amounts will be calculated as the sum of (a) the longest-dated potential receivable under the purchase agreement and (b) the remaining maturity of the purchase facility.

2. Risk-weighted assets for dilution risk

325. Dilution refers to the possibility that the receivable amount is reduced through cash or non-cash credits to the receivable's obligor.⁷² For both corporate and retail receivables, unless the bank can demonstrate to its supervisor that the dilution risk for the purchasing bank is immaterial, the treatment of dilution risk must be the following: at the level of either the pool as a whole ('top-down' approach) or the individual receivables making up the pool ('bottom-up' approach), the purchasing bank will estimate the one-year EL for dilution risk, also expressed in percentage of the nominal receivables amount. As with the treatments of default risk, this estimate must be computed on a stand-alone basis; that is, under the assumption of no recourse or other support from the seller or third party guarantors. For the purpose of calculating risk weights for dilution risk, the corporate risk-weight function will be used with the following settings: the PD will be set equal to the estimated EL, and the LGD will be set at 100%.

326. 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.

(i) Treatment of purchase discounts

327. Purchase discounts will be treated in the same manner as purchased loans. Under this approach, any purchase discounts will be recognised through adjustments to the total EL portion of the capital charge for default and dilution risk.

(ii) Recognition of guarantees

328. Credit risk mitigants will be recognised using the same general framework as set forth in paragraphs 261 to 268. 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 bank will substitute the risk weight for an exposure to the guarantor in place of the pool's total risk weight for default and dilution risk.
- If the guarantee covers only default risk or dilution risk, but not both, the bank will substitute the risk weight for an exposure to the guarantor in place of the pool's risk

⁷² 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).

weight for the corresponding risk component (default or dilution). 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 tranching coverage (i.e. the risk weights of the uncovered risk components will be added to the risk weights of the covered risk components).

G. Recognition of Provisions

329. Section G discusses the method by which a bank may recognise provisions, (e.g. portfolio-specific general provisions such as country risk provisions or general provisions taken against credit risk in specific sectors) in offsetting the expected loss (EL) of risk weighted assets in a given asset class. With the exception of qualifying retail exposures, the EL portion of risk-weighted assets is defined as 12.5 times PD times LGD times EAD. For qualifying retail exposures, the EL portion of risk weighted assets is defined as (a) 12.5 times PD times LGD times EAD minus (b) 12.5 times the FMI recognised as an offset to the EL capital charge discussed in paragraphs 289 to 290.

330. For defaulted assets, any amount of specific provisions and partial write-offs that exceeds the EL capital charge for the underlying exposures may be used to cover the EL capital charge against other defaulted assets in the same asset class. This is to be accomplished through a reduction of total risk weighted assets in the amount of 12.5 times the surplus. Such a surplus may not be used to reduce any other capital charges. In the case of retail exposures, this rule applies for each retail exposure sub-category (i.e. those secured by residential mortgages versus those that are qualifying revolving exposures and all other retail exposures).

331. For non-defaulted assets, any amount of specific provisions and partial write-offs that exceeds the EL capital charge for the underlying exposures may not be used to cover any other capital charges.⁷³

332. Any discounts on purchased assets must be treated in the same manner as partial write-offs. Any premium on purchased assets must be multiplied by 12.5 and added to the EL portion of risk weighted assets.

333. The amount equal to 12.5 times the amount of general loan loss provisions in excess of the limit for inclusion in Tier 2 capital (see 1988 Accord (updated to April 1998) paragraphs 18 to 21 and 14) can be used to charge against the EL portion of risk-weighted assets. Any amount of the excess general loan loss provisions that exceeds the EL charge may not be used to reduce any non-EL portion of the risk-weighted assets. The amount equal to 12.5 times the amount of portfolio-specific general provisions (such as country risk provisions or general provisions taken against credit risk in specific sectors) can be used to charge against the EL portion of the risk-weighted assets of the pool of exposures against which these provisions have been taken. Any amount of portfolio-specific general provisions in excess of the EL charge on that pool may not be used to reduce any other portion of risk-weighted assets.

⁷³ Due to the reference definition of default, specific provisions and partial write offs will in most cases trigger default. They can only be counted against the EL charge of non-defaulted assets if they do not trigger default, e.g. if they are raised for non-material credit related losses, as specific provisions for general country risk or in similar cases.

H. Minimum Requirements for IRB Approach

334. Part H presents the minimum requirements for entry and on-going use of the IRB approach. The minimum requirements are set out in 11 separate sections concerning: (a) composition of minimum requirements, (b) compliance with minimum requirements, (c) rating system design, (d) risk rating system operations, (e) corporate governance and oversight, (f) use of internal ratings, (g) risk quantification, (h) validation of internal estimates, (i) supervisory LGD and EAD estimates, (j) calculation of capital charges for equity exposures, and (k) disclosure requirements. It may be helpful to note that the minimum requirements cut across asset classes. Therefore, more than one asset class may be discussed within the context of a given minimum requirement.

1. Composition of minimum requirements

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

336. The overarching principle behind these requirements is that rating and risk estimation systems and processes provide for a meaningful assessment of borrower and transaction characteristics; a meaningful differentiation of risk; and reasonably accurate and consistent quantitative estimates of risk. Furthermore, these systems and processes must be consistent with internal use of these estimates. The Committee recognises that differences in markets, rating methodologies, banking products, and practices require banks and supervisors to customise their operational procedures. It is not the Committee's intention to dictate the form or operational detail of banks' risk management policies and practices. Each supervisor will develop detailed review procedures to ensure that banks' systems and controls are adequate to serve as the basis for the IRB approach.

337. The minimum requirements set out in this document 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.

338. The minimum requirements set out in this document apply to both foundation and advanced approaches unless noted otherwise. Generally, all IRB banks must produce their own estimates of PD⁷⁴ and must adhere to the overall requirements for rating system design, operations, controls, and corporate governance, as well as the requisite requirements for estimation and validation of PD measures. Banks wishing to use their own estimates of LGD and EAD must also meet the incremental minimum requirements for these risk factors included in paragraphs 415 to 436.

2. Compliance with minimum requirements

339. To be eligible for an IRB approach, a bank must demonstrate to its supervisor that it meets the IRB requirements in this document, at the outset and on an ongoing basis. Banks'

⁷⁴ Banks are not required to produce their own estimates of PD for certain equity exposures and certain exposures that fall within the SL sub-class.

overall credit risk management practices must also be consistent with the evolving sound practice guidelines issued by Basel Committee and national supervisors.

340. There may be circumstances when a bank is not in complete compliance with all the minimum requirements. Where this is the case, the bank must produce a plan for a timely return to compliance, and seek approval from its supervisor, or the bank must demonstrate that the effect of such non-compliance is immaterial in terms of the risk posed to the institution. Failure to produce an acceptable plan or satisfactorily implement the plan or to demonstrate immateriality will lead supervisors to reconsider the bank's eligibility for the IRB approach. Furthermore, for the duration of any non-compliance, supervisors will consider the need for the bank to hold additional capital under Pillar 2 or take other appropriate supervisory action.

3. Rating system design

341. The term "rating system" comprises all of the methods, processes, controls, and data collection and IT systems that support the assessment of credit risk, the assignment of internal risk ratings, and the quantification of default and loss estimates.

342. Within each asset class, a bank may utilise multiple rating methodologies/systems. For example, a bank may have customised rating systems for specific industries or market segments (e.g. middle market, and large corporate). If a bank chooses to use multiple systems, the rationale for assigning a borrower to a rating system must be documented and applied in a manner that best reflects the level of risk of the borrower. Banks must not allocate borrowers across rating systems inappropriately to minimise regulatory capital requirements (i.e. cherry-picking by choice of rating system). Banks must demonstrate that each system used for IRB purposes is in compliance with the minimum requirements at the outset and on an ongoing basis.

(i) Rating dimensions

Standards for corporate, sovereign, and bank exposures

343. A qualifying IRB rating system must have two separate and distinct dimensions. 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. Firstly, in the case of country transfer risk, where a bank may assign different borrower grades depending on whether the facility is denominated in local or foreign currency. 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.

344. A bank must articulate in its credit policy the relationship between borrower grades in terms of the level of risk each grade implies. Perceived and measured risk must increase as credit quality declines from one grade to the next. The policy must articulate the risk of each grade in terms of both a description of the probability of default risk typical for borrowers assigned the grade and the criteria used to distinguish that level of credit risk.

345. The second dimension must reflect transaction specific factors, such as collateral, seniority, product type, etc. For foundation IRB banks, this requirement can be fulfilled by the existence of a facility dimension, which reflects both borrower and transaction specific factors. For example, a rating dimension that reflects expected loss (EL) by incorporating both borrower strength (PD) and loss severity (LGD) considerations would qualify. Likewise a rating system that exclusively reflects LGD would qualify. Where a rating dimension reflects

expected loss and does not separately quantify LGD, the supervisory estimates of LGD must be used.

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

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

Standards for retail exposures

348. Rating systems for retail exposures must be oriented to both borrower and transaction risk, and must capture all relevant borrower and transaction characteristics. Banks must assign each exposure that falls within the definition of retail for IRB purposes into a particular pool. Banks must demonstrate that this process provides for a meaningful differentiation of risk, provides for a grouping of sufficiently homogenous loans, and allows for accurate and consistent estimation of loss characteristics at pool level.

349. For each pool, banks must estimate PD, LGD, and EAD. Multiple pools may share identical PD, LGD and EAD estimates. At a minimum, banks must take into account the following characteristics in the process of assigning exposures to a pool:

- Borrower risk characteristics (e.g. borrower type, demographics such as age/occupation);
- Transaction risk characteristics, including product and/or collateral types (e.g. loan to value measures, seasoning, guarantees; and seniority (first vs. second lien)). Banks must explicitly address cross-collateral provisions where present.
- Delinquency of exposure: Banks are expected to separately identify loans that are delinquent and those that are not. At a minimum, there must be at least two distinct and identifiable categories for pools of loans that are in arrears (but not in default according to the reference definition).

(ii) Rating structure

Standards for corporate, sovereign, and bank exposures

350. A bank must have a meaningful distribution of exposures across grades with no excessive concentrations, on both its borrower-rating and its facility-rating scales.

351. To meet this objective, a bank must have a minimum of seven borrower grades for non-defaulted borrowers and one for those that have defaulted. Banks with lending activities focused on a particular market segment may satisfy this requirement with the minimum number of grades; supervisors may require banks which lend to borrowers of diverse credit quality to have a greater number of borrower grades.

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

353. Banks with loan portfolios concentrated in a particular market segment and range of default risk must have enough grades within that range to avoid undue concentrations of borrowers in a particular grade. Significant concentrations within a single grade must be supported by convincing empirical evidence that the grade covers a reasonably narrow PD band and that the default risk posed by all borrowers in the grade falls within that band.

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

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

Standards for retail exposures

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

(iii) Rating criteria

357. A bank must have specific rating definitions, processes and criteria for assigning exposures to grades within a rating system. The rating definitions and criteria must be both plausible and intuitive and must result in a meaningful differentiation of risk.

- The grade descriptions and criteria must be sufficiently detailed to allow those charged with assigning ratings to consistently assign the same grade to borrowers or facilities posing similar risk. This consistency should exist across lines of business, departments and geographic locations. If rating criteria and procedures differ for different types of borrowers or facilities, the bank must monitor for possible inconsistency, and must alter rating criteria to improve consistency when appropriate.
- Written rating definitions must be clear and detailed enough to allow third parties to understand the assignment of ratings, such as internal audit and supervisors, to replicate rating assignments and evaluate the appropriateness of the grade/pool assignments.
- The criteria must also be consistent with the bank’s internal lending standards and its policies for handling troubled borrowers and facilities.

358. Banks must take all relevant available information into account in assigning ratings to borrowers and facilities. Information must be current. The less information a bank has, the

more conservative must be its assignments of exposures to borrower and facility grades or pools. An external rating can be the primary factor determining an internal rating assignment; however, the bank must ensure that it considers other relevant information.

SL product lines within the corporate asset class

359. Banks using the supervisory slotting criteria for SL exposures must assign exposures to their internal rating grades based on their own criteria, systems and processes, subject to compliance with the requisite minimum requirements. Banks must then map these internal rating grades into the five supervisory rating categories. Tables 1-4 in Annex 4 provide, for each sub-class of SL exposures, the general assessment factors and characteristics exhibited by the exposures that fall under each of the supervisory categories. Each lending activity has a unique table describing the assessment factors and characteristics.

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

(iv) Assessment horizon

361. Although the time horizon used in PD estimation is one year, banks must use a longer time horizon in assigning ratings. A borrower rating must represent the bank's assessment of the borrower's ability and willingness to contractually perform despite adverse economic conditions or the occurrence of unexpected events.

362. A bank may satisfy this requirement by basing rating assignments on specific, appropriate stress scenarios. Alternatively, a bank may satisfy the requirement by appropriately taking into account borrower characteristics that are reflective of the borrower's vulnerability to adverse economic conditions or unexpected events, without explicitly specifying a stress scenario. The range of economic conditions that are considered when making assessments must be consistent with current conditions and those that are likely to occur over a business cycle within the respective industry/geographic region.

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

(v) Use of models

364. The requirements in this section apply to statistical models and other mechanical methods used to assign borrower or facility ratings or in estimation of PDs, LGDs, or EADs. Credit scoring models and other mechanical rating procedures generally use only a subset of available information. Although mechanical rating procedures may sometimes avoid some of the idiosyncratic errors made by rating systems in which human judgement plays a large role, mechanical use of limited information also is a source of rating errors. Credit scoring models and other mechanical procedures are permissible as the primary or partial basis of rating assignments, and may play a role in the estimation of loss characteristics. Sufficient human judgement and human oversight is necessary to ensure that all relevant information, including that which is outside the scope of the model, is also taken into consideration, and that the model is used appropriately.

- The burden is on the bank to satisfy its supervisor 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 that are input to the model must form a reasonable set of predictors. The model must be accurate on average across the range of borrowers or facilities to which the bank is exposed and there must be no known material biases.
- The bank must have in place a process for vetting data inputs into a statistical default or loss prediction model which includes an assessment of the accuracy, completeness and appropriateness of the data specific to the assignment of an approved rating.
- The bank must demonstrate that the data used to build the model are representative of the population of the bank's actual borrowers or facilities.
- When combining model results with human judgement, the judgement must take into account all relevant information not considered by the model. The bank must have written guidance describing how human judgement and model results are to be combined.
- The bank must have procedures for human review of model-based rating assignments. Such procedures should focus on finding and limiting errors associated with known model weaknesses and must also include credible ongoing efforts to improve the model's performance.
- The bank 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*

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

366. Banks must document the specific definitions of default and loss used internally and demonstrate consistency with the reference definitions set out in paragraphs 399 to 407.

367. If the bank employs statistical models in the rating process, the bank must document their methodologies. This material must:

- provide a detailed outline of the theory, assumptions and/or mathematical and empirical basis of the assignment of estimates to grades, individual obligors, exposures, or pools, and the data source(s) used to estimate the model;
- establish a rigorous statistical process (including out-of-time and out-of-sample performance tests) for validating the model; and

- indicate any circumstances under which the model does not work effectively.

368. Use of a model obtained from a third-party vendor that claims proprietary technology is not a justification for exemption from documentation or any other of the requirements for internal rating systems. The burden is on the model's vendor and the bank to satisfy supervisors.

4. Risk rating system operations

(i) Coverage of ratings

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

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

(ii) Integrity of rating process

Standards for corporate, sovereign, and bank exposures

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

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

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

Standards for retail exposures.

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

(iii) Overrides

375. For rating assignments based on expert judgement, banks must clearly articulate the situations in which bank officers may override the outputs of the rating process, including how and to what extent such overrides can be used and by whom. For model-based ratings, the bank must have guidelines and processes for monitoring cases where human judgement

has overridden the model's rating, variables were excluded or inputs were altered. These guidelines must include identifying personnel that are responsible for approving these overrides. Banks must identify overrides and separately track their performance.

(iv) Data maintenance

376. A bank must collect and store data on key borrower and facility characteristics to provide effective support to its internal credit risk measurement and management process, to enable the bank to meet the other requirements in this document, and to serve as a basis for supervisory reporting. These data should be sufficiently detailed to allow retrospective re-allocation of obligors and facilities to grades, for example if increasing sophistication of the internal rating system suggests that finer segregation of portfolios can be achieved. Furthermore, banks must collect and retain data on all aspects of internal ratings that form part of the core public disclosure requirements for IRB under Pillar 3 (to be specified in the Third Consultative Document).

For corporate, sovereign, and bank exposures

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

378. Banks using the advanced IRB approach must also collect and store a complete history of data on the LGD and EAD estimates associated with each facility and the key data used to derive the estimate and the person/model responsible. Banks must also collect data on the estimated and realised LGDs and EADs associated with each defaulted facility. Banks that reflect the credit risk mitigating effects of guarantees/credit derivatives through LGD must retain data on the LGD of the facility before and after evaluation of the effects of the guarantee/credit derivative. Information about the components of loss or recovery for each defaulted exposure must be retained, such as amounts recovered, source of recovery (e.g. collateral, liquidation proceeds and guarantees) time period required for recovery, and administrative costs.

379. Banks under the foundation approach which utilise supervisory estimates are encouraged to retain the relevant data (i.e. data on loss and recovery experience for corporate loans under the foundation approach, data on realised losses for banks using the supervisory slotting criteria for SL).

For retail exposures

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

(v) Stress tests used in assessment of capital adequacy

381. An IRB bank must have in place sound stress testing processes for use in the assessment of capital adequacy. Stress testing must involve identifying possible events or

future changes in economic conditions that could have unfavourable effects on a bank's credit exposures and assessment of the bank's ability to withstand such changes. Examples of scenarios that usefully could be examined are (i) economic or industry downturns; (ii) market-risk events; and (iii) liquidity conditions.

382. In addition to the more general tests described above, the bank must perform a credit risk stress test to assess the effect of certain specific conditions on its IRB regulatory capital requirements. The test to be employed would be one chosen by the bank, subject to supervisory review. The test to be employed must be meaningful and reasonably conservative. Individual banks may develop different approaches to undertaking this stress test requirement, depending on their circumstances. For this purpose, the objective is not to require banks to consider worst-case scenarios. The bank's stress test in this context should, however, consider at least the effect of mild recession scenarios. In this case, one example might be to use two consecutive quarters of zero growth to assess the effect on the bank's PDs, LGDs and EAD, taking account – on a conservative basis – of the bank's international diversification.

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

384. National supervisors may wish to issue guidance to their banks on how the tests to be used for this purpose should be designed, bearing in mind conditions in their jurisdiction. The results of the stress test may indicate no difference in the capital calculated under the IRB rules described in this section of the New Accord if the bank already uses such an approach for its internal rating purposes. Where a bank operates in several markets, it need not test for such conditions in all of those markets, but a bank should stress portfolios containing the vast majority of its total exposures.

5. Corporate governance and oversight

(i) Corporate governance

385. All material aspects of the rating and estimation processes must be approved by the bank's board of directors or a designated committee thereof and senior management.⁷⁵ These parties must possess a general understanding of the bank's risk rating system and detailed comprehension of its associated management reports. Senior management must provide notice to the board of directors or a designated committee thereof of material changes or exceptions from established policies that will materially impact the operations of the bank's rating system.

⁷⁵ This standard refers to a management structure composed of a board of directors and senior management. The Committee is aware that there are significant differences in legislative and regulatory frameworks across countries as regards the functions of the board of directors and senior management. In some countries, the board has the main, if not exclusive, function of supervising the executive body (senior management, general management) so as to ensure that the latter fulfils its tasks. For this reason, in some cases, it is known as a supervisory board. This means that the board has no executive functions. In other countries, by contrast, the board has a broader competence in that it lays down the general framework for the management of the bank. Owing to these differences, the notions of the board of directors and senior management are used in this paper not to identify legal constructs but rather to label two decision-making functions within a bank.

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

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

(ii) Credit risk control

388. Banks must have independent credit risk control units that are responsible for the design or selection, implementation and performance of their internal rating systems. The unit(s) must be functionally independent from the personnel and management functions responsible for originating exposures. Areas of responsibility must include:

- Testing and monitoring internal grades;
- Production and analysis of summary reports from the bank's rating system, to include historical default data sorted by rating at the time of default and one year prior to default, grade migration analyses, and monitoring of trends in key rating criteria;
- Implementing procedures to verify that rating definitions are consistently applied across departments and geographic areas;
- Reviewing and documenting any changes to the rating process, including the reasons for the changes; and
- Reviewing the rating criteria to evaluate if they remain predictive of risk. Changes to the rating process, criteria or individual rating parameters must be documented and retained for supervisors to review.

389. A credit risk control unit must actively participate in the development, selection, implementation and validation of rating models. It must assume oversight and supervision responsibilities for any models used in the rating process, and ultimate responsibility for the ongoing review and alterations to rating models.

(iii) Internal and external audit

390. Internal audit must review at least annually the bank's rating system and its operations, including the operations of the credit function and the estimation of PDs, LGDs and EADs. Areas of review include adherence to all applicable minimum requirements. Internal audit must document its findings. Some national supervisors may also require an external audit of the bank's rating assignment process and estimation of loss characteristics.

6. Use of internal ratings

391. Internal ratings and default and loss estimates must play an essential role in the credit approval, risk management, internal capital allocations, and corporate governance functions of banks using the IRB approach. Ratings systems and estimates designed and implemented exclusively for the purpose of qualifying for the IRB approach and used only to provide IRB inputs are not acceptable.

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

7. Risk quantification

(i) Overall requirements for estimation

Structure and intent

393. This section addresses the broad standards for own-estimates of PD, LGD, and EAD. Generally, all IRB banks must estimate a PD⁷⁶ for each internal borrower grade (corporate/bank/sovereign) or for each pool (retail).

394. PD estimates must be a long-run average of one-year realised default rates for borrowers in the grade, with the exception of retail exposures (see below). Requirements specific to PD estimation alone appear in paragraphs 408 to 414. Banks on the advanced approach must estimate a long-run default-weighted average LGD (as defined in paragraph 415) for each of its facilities (or retail pools). Requirements specific to LGD estimation alone appear in paragraphs 415 to 420. Banks on the advanced approach must also estimate a long-run default-weighted average EAD for each of its facilities. Requirements specific to EAD estimation alone appear in paragraphs 421 to 426. For corporate, bank, and sovereign exposures, banks that do not meet the requirements for own-estimates of EAD or LGD, above, must use the supervisory estimates of these parameters. Standards for use of such estimates are set out in paragraph 454.

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

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

397. The population of exposures represented in the data used for estimation, and lending standards in use when the data were generated, and other relevant characteristics should be closely matched to or at least comparable with those of the bank's exposures and standards. The bank must also demonstrate that the 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

⁷⁶ Banks are not required to produce their own estimates of PD for certain equity exposures and certain exposures that fall within the SL sub-class.

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

398. In preparing estimates, a bank's basic goal must be to achieve an accurate estimate of the long-run average. However, the true value is unobservable, and estimates will involve some unpredictable errors. In order to avoid over-optimism, a bank must add to its estimates a margin of conservatism that is related to the likely range of errors. Where methods and data are less satisfactory and the likely range of errors is larger, the margin of conservatism must be larger.

Reference definitions of default and loss

Issues related to definition of default - all asset classes.

(ii) Definition of default

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

- The bank considers that the obligor is unlikely to pay its credit obligations to the banking group in full, without recourse by the bank to actions such as realising security (if held).
- The obligor is past due more than 90 days on any material credit obligation to the banking group.⁷⁷ Overdrafts will be considered as being past due once the customer has breached an advised limit or been advised of a limit smaller than current outstandings.

400. The elements to be taken as indications of unlikelihood to pay include:

- The bank puts the credit obligation on non-accrued status.
- The bank makes a charge-off or account-specific provision resulting from a significant perceived decline in credit quality subsequent to the bank taking on the exposure.
- The bank sells the credit obligation at a material credit-related economic loss.
- The bank consents to a distressed restructuring of the credit obligation where this is likely to result in a diminished financial obligation caused by the material forgiveness, or postponement, of principal, interest or (where relevant) fees.⁷⁸
- The bank has filed for the obligor's bankruptcy or a similar order in respect of the obligor's credit obligation to the banking group.
- The obligor has sought or has been placed in bankruptcy or similar protection where this would avoid or delay repayment of the credit obligation to the banking group.

⁷⁷ In the case of retail and PSE obligations, for the 90 days figure, a supervisor may substitute a figure up to 180 days for different products, as it considers appropriate to local conditions. In one member country, local conditions make it appropriate to use a figure of up to 180 days also for lending by its banks to corporates; this applies for a transitional period of 5 years.

⁷⁸ Including, in the case of equity holdings assessed under a PD/LGD approach, such distressed restructuring of the equity itself.

401. National supervisors will provide appropriate guidance as to how these elements must be implemented and monitored.

402. For retail exposures, the definition of default can be applied at the level of a particular facility, rather than at the level of the obligor. As such, default by a borrower on one obligation does not require a bank to treat all other obligations to the banking group as defaulted.

403. A bank must record actual defaults on IRB exposure classes using this reference definition. A bank must also use the reference definition for its estimation of PDs, and (where relevant) LGDs and EADs. In arriving at these estimations, a bank may use external data available to it that is not itself consistent with that definition, subject to the requirements set out in paragraph 409. However, in such cases, banks must demonstrate to their supervisors that appropriate adjustments to the data have been made to achieve broad equivalence with the reference definition. This same condition would apply to any internal data used up to implementation of the New Accord. Internal data (including that pooled by banks) used in such estimates beyond the date of implementation of the Accord must be consistent with the reference definition.

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

(iii) Reaging

405. The bank must have clearly articulated and documented policies in respect of the counting of days past due, in particular in respect of the re-ageing of the facilities and the granting of extensions, deferrals, renewals and rewrites to existing accounts. At a minimum, the reaging policy must include: (a) approval authorities and reporting requirements; (b) minimum age of a facility before it is eligible for reaging; (c) delinquency levels of facilities that are eligible for reaging; (d) maximum number of reagings per facility; and (e) a reassessment of borrower's capacity to repay. These policies must be applied consistently over time, and must support the 'use test', (i.e. if a bank treats a re-aged loan in a similar fashion to other delinquent exposures more than the past-due cut off point, this exposure must be recorded as in default for IRB purposes). Some supervisors may choose to establish more specific requirements on reaging for banks in their jurisdiction.

(iv) Treatment of overdrafts

406. Authorised overdrafts must be subject to a credit limit set by the bank and brought to the knowledge of the client. Any break of this limit must be monitored; if the account were not brought under the limit after 90-180 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 were not repaid within 90-180 days, the exposure would be considered in default. Banks must have in place rigorous internal policies for assessing the creditworthiness of customers who are offered overdraft accounts.

(v) Definition of loss - all asset classes

407. The definition of loss used in estimating LGD is economic loss. This must include discount effects and direct and indirect costs associated with collecting on the exposure. Banks must not simply measure the loss recorded in accounting records, although they must be able to compare accounting and economic losses. The bank's own workout and collection

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

(vi) *Requirements specific to PD estimation*

Corporate, sovereign, and bank exposures

408. Banks may use one or more of the three specific techniques set out below (internal default experience, mapping to external data, and statistical default models), as well as other information and techniques as appropriate to estimate the average PD for each rating grade.

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

- A bank may use data on internal default experience for the estimation of PD. A bank must demonstrate in its analysis that the estimates are reflective of underwriting standards and of any differences in the rating system that generated the data and the current rating system. Where only limited data are available, or where underwriting standards or rating systems have changed, the bank must add a greater margin of conservatism in its estimate of PD. The use of pooled data across institutions may also be recognised. A bank must demonstrate that the internal rating systems and criteria of other banks in the pool are comparable with its own.
- Banks may associate or map their internal grades to the scale used by an external credit assessment institution or similar institution and then attribute the default rate observed for the external institution's grades to the bank'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. The bank's analysis must include a comparison of the default definitions used, subject to the requirements in paragraph 399 to 404 (definition of default). The bank must document the basis for the mapping.
- A bank is allowed to use a simple average of default-probability estimates for individual borrowers in a given grade, where such estimates are drawn from statistical default prediction models. The bank's use of default probability models for this purpose must meet the standards specified in paragraph 364.

410. Irrespective of whether a bank is using external, internal, or pooled data sources, or a combination of the three, for its PD estimation, the length of the underlying historical observation period used must be at least five years for at least one source. If the available observation period spans a longer period for any source, and this data are relevant, this longer period must be used.

Retail exposures

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

profile and the composition of the external data. In all cases banks must use all relevant data sources as points of comparison.

412. One method for deriving long run average estimates of PD and LGD for retail would be based on an estimate of total losses, and an appropriate estimate of PD or LGD. A bank may use the PD estimate to infer the appropriate LGD, or use the LGD estimate to infer the appropriate PD. The process for estimating total losses must meet the overall standards for estimation of PD and LGD set out in section H, and the outcome must be consistent with the concept of a default-weighted LGD (as defined in paragraph 415).

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

414. The Committee recognises that seasoning can be quite material for some long-term retail loans characterised by seasoning effects that peak several years after origination. Banks should anticipate the implications of rapid loan growth and take steps to ensure that their estimation techniques are accurate, and that their current capital level and earnings and funding prospects are adequate to cover their future capital needs. In order to avoid gyrations in their required capital positions arising from short-term PD horizons, banks are also encouraged to adjust PD estimates upward for anticipated seasoning effects, provided such adjustments are applied in a consistent fashion over time. Within some jurisdictions, such adjustments might be made mandatory, subject to supervisory discretion.

(vii) Requirements specific to own-LGD estimates

Standards for all asset classes

415. A bank must estimate a long-run average LGD for each facility. This estimate must be based on the average economic loss of all observed defaults within the data source (referred to elsewhere in this section as the default weighted average) and should not, for example, be the average of average annual loss rates. Since defaults are likely to be clustered during times of economic distress and LGDs may be correlated with default rates, a time-weighted average may materially understate loss severity per occurrence. Thus, it is important that banks utilise default-weighted averages as defined above in computing loss severity estimates. Moreover, for exposures for which LGD estimates are volatile over the economic cycle, the bank must use LGD estimates that are appropriate for an economic downturn if those are more conservative than the long-run average.

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

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

418. For the specific case of facilities already in default, the bank must use its best estimate of expected loss for each facility given current economic circumstances and facility status. Collected fees from defaulted borrowers, including fees for late payment, may be treated as recoveries for the purpose of the bank's LGD estimation. Unpaid late fees, to the extent that they have been capitalised in the bank's income statement, must be added to the bank's measure of exposure or loss.

Additional standards for corporate, sovereign, and bank exposures

419. 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

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

(viii) Requirements specific to own-EAD estimates

Standards for all asset classes

421. EAD for an on-balance sheet or off-balance sheet item is defined as the expected gross exposure of the facility upon default of the obligor. For on-balance sheet items, banks must estimate EAD at no less than the current drawn amount, subject to 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 that under the foundation approach. The additional minimum requirements for internal estimation of EAD under the advanced approach, therefore, focus on the estimation of EAD for off-balance sheet items (excluding derivatives). Advanced approach banks must have established procedures in place for the estimation of EAD for off-balance sheet items. These must specify the estimates of EAD to be used for each facility type. Banks estimates of EAD should reflect the possibility of additional drawings by the borrower up to and after the time a default event is triggered. Where estimates of EAD differ by facility type, the delineation of these facilities must be clear and unambiguous.

422. Advanced approach banks must assign an estimate of EAD for each facility. It must be an estimate of the long-run default-weighted average EAD for similar facilities and borrowers over a sufficiently long period of time, but with a margin of conservatism appropriate to the likely range of errors in the estimate. If a positive correlation can reasonably be expected between the default frequency and the magnitude of EAD, the EAD estimate must incorporate a larger margin of conservatism. Moreover, for exposures for which EAD estimates are volatile over the economic cycle, the bank must use EAD estimates that are appropriate for an economic downturn, if these are more conservative than the long-run average.

423. The criteria by which estimates of EAD are derived must be plausible and intuitive, and represent what the bank believes to be the material drivers of EAD. The choices must be supported by credible internal analysis by the bank. The bank must be able to provide a breakdown of its EAD experience by the factors it sees as the drivers of EAD. A bank must use all relevant information in its derivation of EAD estimates. Across facility types, a bank must review its estimates of EAD when material new information comes to light and at least on an annual basis.

424. Due consideration must be paid by the bank to its specific policies and strategies adopted in respect of account monitoring and payment processing. The bank must also consider its ability and willingness to prevent further drawings in circumstances short of payment default, such as covenant violations or other technical default events. Banks must also have adequate systems and procedures in place to monitor facility amounts, current outstandings against committed lines and changes in outstandings per borrower and per grade. The bank must be able to monitor outstanding balances on a daily basis.

Additional standards for corporate, sovereign, and bank exposures

425. Estimates of EAD must be based on a time period that must ideally cover a complete economic cycle but must in any case be no shorter than a period of seven years. If the available observation period spans a longer period for any source, and the data are relevant, this longer period must be used. Similar to LGD estimates, EAD estimates must be calculated using a default-weighted average and not a time-weighted average.

Additional standards for retail exposures

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

(ix) Minimum 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.

Operating requirements

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

428. In all cases, both the borrower and the guarantor must be assigned a borrower rating at the outset and on an ongoing basis. A bank must follow all minimum requirements for assigning borrower ratings set out in this document, including the regular monitoring of the guarantor's condition and ability and willingness to honour its obligations. Consistent with the requirements in xx, a bank must retain all relevant information on the borrower absent the guarantee and the guarantor. In the case of retail guarantees, these requirements also apply to the assignment of an exposure to a pool, and the estimation of PD.

429. In no case can the bank assign the guaranteed exposure an adjusted PD or LGD such that the adjusted risk weight would be lower than that of a comparable, direct exposure to the guarantor. Neither criteria nor rating processes are permitted to consider possible favourable effects of imperfect expected correlation between default events for the borrower and guarantor for purposes of regulatory minimum capital requirements. As such, the adjusted risk weight must not reflect the risk mitigation of "double default."

Eligible guarantors and guarantees

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

431. The guarantee must be evidenced in writing, non-cancellable on the part of the guarantor in force until the debt is satisfied in full (to the extent of the amount and tenor of the guarantee) and legally enforceable against the guarantor in a jurisdiction where the guarantor has assets to attach and enforce a judgement. However, in contrast to the foundation approach to corporate, banks, and sovereigns, guarantees prescribing conditions under which the guarantor may not be obliged to perform (conditional guarantees) may be recognised under certain conditions. Specifically, the onus is on the bank to demonstrate that the assignment criteria adequately address any potential reduction in the risk mitigation effect.

Adjustment criteria

432. A bank must have clearly specified criteria for adjusting borrower grades or LGD estimates (or in the case of retail and eligible purchased receivables, the process of allocating exposures to pools) to reflect the impact of guarantees for regulatory capital purposes. These criteria must be as detailed as the criteria for assigning exposures to grades consistent with paragraphs 357 and 358, and must follow all minimum requirements for assigning borrower or facility ratings set out in this document.

433. The criteria must be plausible and intuitive, and must address the guarantor's ability and willingness to perform under the guarantee. The criteria must also address the likely timing of any payments and the degree to which the guarantor's ability to perform under the guarantee is correlated with the borrower's ability to repay. The bank's criteria must also consider the extent to which residual risk to the borrower remains, for example a currency mismatch between the guarantee and the underlying exposure.

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

Credit derivatives

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

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

For banks using foundation LGD estimates.

437. The minimum requirements outlined in paragraphs 427 to 436 are identical save for the following exceptions:

- (i) the bank is not able to use an 'LGD-adjustment' option; and

(ii) the range of eligible guarantees and guarantors is limited to those recognised under the standardised approach (see paragraph 159).

(x) *Requirements specific to estimating PD and LGD (or EL) for qualifying purchased receivables*

438. In addition to the current risk quantification standards, the following minimum requirements will apply for quantifying the risk of eligible purchased receivables:

Minimum requirements for estimating PD and LGD (or EL)

439. 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 'top-down' or 'bottom-up' IRB treatments of dilution risk.

440. The purchasing bank will be required to group the receivables into sufficiently homogeneous pools so that accurate and consistent estimates of PD and LGD (or EL) for default losses and EL estimates 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, methods and data for estimating PD, LGD, and EL must comply with the existing risk quantification standards for retail exposures. In particular, quantification should reflect all information available to the purchasing bank regarding the quality of the underlying receivables, including data for similar pools provided by the seller, by the purchasing bank, or by external sources. The purchasing bank must verify any data provided by the seller and relied upon by the purchasing bank.

Minimum operational requirements

441. A bank purchasing receivables has to justify confidence that current and future advances can be repaid from the liquidation of (or collections against) the receivables pool. To qualify for the 'top-down' treatment of default risk, the receivable pool and overall lending relationship should be closely monitored and controlled. Specifically, a bank will have to demonstrate the following:

Legal Certainty

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

Effectiveness of Monitoring Systems

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

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

- The bank must have clear and effective policies and procedures for determining seller and servicer eligibility. The bank or its agent must conduct periodic reviews of sellers and servicers in order to verify the accuracy of reports from the seller/servicer, detect fraud or operational weaknesses, and verify the quality of the seller's credit policies and servicer's collection policies and procedures. The findings of these reviews must be well documented.
- The bank must have the ability to assess the characteristics of the receivables pool, including (a) interdependencies between the performance of individual exposures in the pool; (b) over-advances; (c) history of the seller's arrears, bad debts, and bad debt allowances; (d) payment terms, and (e) potential contra accounts.
- The bank must have effective policies and procedures for monitoring on an aggregate basis single-obligor concentrations both within and across receivables pools, including a requirement that significant exposures must be individually reviewed.
- The bank must receive timely and sufficiently detailed reports of receivables agings and dilutions to (a) ensure compliance with the bank's eligibility criteria and advancing policies governing purchased receivables, and (b) provide an effective means with which to monitor and confirm the seller's terms of sale (e.g. invoice date aging) and dilution.

Effectiveness of Work-out Systems

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

- The bank should have clear and effective policies, procedures, and information systems to monitor compliance with (a) all contractual terms of the facility (including covenants, advancing formulas, concentration limits, early amortisation triggers, etc.) as well as (b) the bank's internal policies governing advance rates and receivables eligibility. The bank's systems should track covenant violations and waivers as well as exceptions to established policies and procedures.
- To limit inappropriate draws, the bank should have effective policies and procedures for detecting, approving, monitoring, and correcting over-advances.
- The bank should have effective policies and procedures for dealing with financially weakened sellers or servicers and/or deterioration in the quality of receivable pools. These include, but are not necessarily limited to, early termination triggers in revolving facilities and other covenant protections, a structured and disciplined approach to dealing with covenant violations, and clear and effective policies and procedures for initiating legal actions and dealing with problem receivables.

Effectiveness of Systems for Controlling Collateral, Credit Availability, and Cash

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

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

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

Compliance with the Bank's Internal Policies and Procedures

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

- Regular internal and/or external audits of all critical phases of the bank's receivables purchase program.
- Verification of the separation of duties between firstly the assessment of the seller/servicer and the assessment of the obligor and secondly between the assessment of the seller/servicer and the field audit of the seller/servicer.

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

8. Validation of internal estimates

448. Banks must have a robust system in place to validate the accuracy and consistency of rating systems, processes, and the estimation of PDs (and for advanced IRB banks, LGDs and EADs). A bank must demonstrate to its supervisor that the internal validation process enables it to assess the performance of internal rating and risk estimation systems consistently and meaningfully.

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

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

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

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

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

9. **Supervisory LGD and EAD estimates**

454. Banks under the foundation IRB approach, which do not meet the requirements for own-estimates of LGD and EAD, above, must meet the minimum requirements described in the standardised approach to receive recognition for eligible financial collateral (as set out in section II B: The Standardised approach - credit risk mitigation). They must meet the following additional minimum requirements in order to receive recognition for additional collateral types.

(i) *Definition of eligible commercial real estate (CRE) and residential real estate (RRE) collateral*

455. CRE and RRE as collateral for corporate, sovereign and bank exposures are defined as:

- collateral where the risk of the borrower is not materially dependent upon the performance of the underlying property or project, but rather on the underlying capacity of the borrower to repay the debt from other sources. As such, repayment of the facility is not materially dependent on any cash flow generated by the underlying CRE/RRE serving as collateral⁷⁹; and
- additionally, the value of the collateral pledged must not be materially dependent on the performance of the borrower. This requirement is not intended to preclude situations where purely macro-economic factors affect both the value of the collateral and the performance of the borrower.

456. 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.⁸⁰

(ii) *Operational requirements for CRE/RRE*

457. Subject to meeting the definition above, CRE and RRE will be eligible for recognition as collateral for corporate claims only if all of the following operational requirements are met.

- **Legal enforceability:** any collateral taken must be legally enforceable under all applicable laws and statutes, and claims on collateral must be properly filed on a timely basis. Collateral interests must reflect a perfected lien (i.e. all legal

⁷⁹ The Committee recognises that in some countries where multifamily housing makes up an important part of the housing market and where public policy is supportive of that sector, including specially established public sector companies as major providers, the risk characteristics of lending secured by mortgage on such residential real estate can be similar to those of traditional corporate exposures. The national supervisor may under such circumstances recognise mortgage on multifamily residential real estate as eligible collateral for corporate exposures.

⁸⁰ As noted in footnote 60, in exceptional circumstances for well-developed and long-established markets, mortgages on office and/or multi-purpose commercial premises and/or multi-tenanted commercial premises may have the potential to receive recognition as collateral in the corporate portfolio. Please refer to footnote 18 of paragraph 45 for a discussion of the eligibility criteria that would apply.

requirements for establishing the claim have been fulfilled). Further, the collateral agreement and the legal process underpinning it must be such that they provide for the bank to realise the collateral value within a reasonable timeframe.

- **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.
- **Frequent revaluation:** the bank is expected to monitor the value of the collateral on a frequent basis and at a minimum once every year. More frequent monitoring is suggested where the market is subject to significant changes in conditions. In addition, a qualified professional must evaluate the property when information indicates that the value of the collateral may have declined materially or when a credit event, such as default, occurs. In other circumstances, statistical methods of evaluation (e.g. reference to house price indices, sampling) may be used to update estimates or to identify collateral that may have declined in value and that may need re-appraisal.
- **Junior liens:** In some member countries, eligible collateral will be restricted to situations where the lender has a first charge over the property.⁸¹ Junior liens may be taken into account where there is no doubt that the claim for collateral is legally enforceable and constitutes an efficient credit risk mitigant. When recognised, junior liens are to be treated using the C*/C** threshold, which is used for senior liens. In such cases, the C* and C** are calculated by taking into account the sum of the junior lien and all more senior liens.

458. Additional collateral management requirements are as follows:

- The types of CRE and RRE collateral accepted by the bank and lending policies (advance rates) when this type of collateral is taken must be clearly documented.
- The bank must take steps to ensure that the property taken as collateral is adequately insured against damage or deterioration.
- The bank must monitor on an ongoing basis the extent of any permissible prior claims (e.g. tax) on the property.
- The bank must appropriately monitor the risk of environmental liability arising in respect of the collateral, such as the presence of toxic material on a property.

(iii) *Requirements for recognition of financial receivables*

Definition of eligible receivables

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

⁸¹ In some of these jurisdictions, first liens are subject to the prior right of preferential creditors, such as outstanding tax claims and employees' wages.

Operational requirements

Legal certainty

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

461. Banks 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 framework that allows the potential lender to have a perfected first priority claim over the collateral.

462. Banks must obtain legal opinions confirming the enforceability of the collateral arrangements in all relevant jurisdictions.

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

Risk management

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

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

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

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

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

Requirements for recognition of other collateral

469. Supervisors may allow for recognition of the credit risk mitigating effect of certain other physical collateral. Each supervisor will determine which, if any, collateral types in its jurisdiction meet the following two standards:

- Existence of liquid markets for disposal of collateral in an expeditious and economically efficient manner.
- Existence of well established, publicly available market prices for the collateral. Supervisors will seek to ensure that the amount a bank receives when collateral is realised does not deviate significantly from these market prices.

470. In order for a given bank to receive recognition for additional physical collateral, it must meet all the standards in paragraphs 457 and 458, subject to the following modifications.

- First Claim: With the sole exception of permissible prior claims specified in footnote 79, only first liens on, or charges over, collateral are permissible. As such, the bank must have priority over all other lenders to the realised proceeds of the collateral.
- The loan agreement must include detailed descriptions of the collateral plus detailed specifications of the manner and frequency of revaluation.
- The types of physical collateral accepted by the bank and policies and practices in respect of the appropriate amount of each type of collateral relative to the exposure amount must be clearly documented in internal credit policies and procedures and available for examination and/or audit review.
- Bank credit policies with regard to the transaction structure must address appropriate collateral requirements relative to the exposure amount, the ability to liquidate the collateral readily, the ability to establish objectively a price or market value, the frequency with which the value can readily be obtained (including a professional appraisal or valuation), and the volatility of the value of the collateral. The periodic revaluation process must pay particular attention to “fashion-sensitive” collateral to ensure that valuations are appropriately adjusted downward of fashion, or model-year, obsolescence as well as physical obsolescence or deterioration.
- In cases of inventories (e.g. raw materials, work-in-process, finished goods, dealers’ inventories of autos) and equipment, the periodic revaluation process must include physical inspection of the collateral.

Requirements for recognition of leasing

471. Leases other than those that expose the bank to residual value risk (see paragraph 472) will be accorded the same treatment as loans collateralised by the same type of collateral. The minimum requirements for the collateral type must be met (CRE/RRE or other collateral). In addition, the bank must also meet the following standards:

- Robust risk management on the part of the lessor with respect to the location of the asset, the use to which it is put, its age, and planned obsolescence;
- A robust legal framework establishing the lessor’s legal ownership of the asset and its ability to exercise its rights as owner in a timely fashion; and

- The difference between the rate of depreciation of the physical asset and the rate of amortisation of the lease payments must not be so large as to overstate the credit risk mitigation attributed to the leased assets.

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

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

10. Calculation of capital charges for equity exposures

(i) The internal models market-based approach

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

474. The Committee recognises that differences in markets, measurement methodologies, equity investments and management practices require banks and supervisors to customise their operational procedures. It is not the Committee's intention to dictate the form or operational detail of banks' risk management policies and measurement practices for their banking book equity holdings. However, some of the minimum requirements are specific. Each supervisor will develop detailed examination procedures to ensure that banks' risk measurement systems and management controls are adequate to serve as the basis for the internal models approach.

(ii) Capital charge and risk quantification

475. Although individual banks or their supervisors have the discretion to apply stricter standards, the following minimum quantitative standards apply for the purpose of calculating minimum capital charges under the internal models approach.

- (a) The capital charge is equivalent to the potential loss on the institution's equity portfolio arising from an assumed instantaneous shock equivalent to the 99.0 percentile, one-tailed confidence interval of quarterly excess returns over an appropriate risk-free rate computed over a long-term sample period.
- (b) The estimated losses should be robust to adverse market movements relevant to the long-term risk profile of the institution's specific holdings. The data used to represent return distributions should reflect the longest sample period for which data are available and meaningful in representing the risk profile of the bank's specific equity holdings. The data used should be sufficient to provide conservative, statistically reliable and robust loss estimates that are not based purely on subjective or judgmental considerations. Institutions must demonstrate to supervisors that the shock employed provides a conservative estimate of potential losses over a relevant long-term market or business cycle. Models estimated using data not reflecting realistic ranges of long-run experience, including a period of reasonably severe declines in equity market values relevant to a bank's holdings,

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

- (c) No particular type of VaR model (e.g. variance-covariance, historical simulation, or Monte Carlo) is prescribed. However, the model used must be able to capture adequately all of the material risks embodied in equity returns including both the general market risk and specific risk exposure of the institution's equity portfolio. Internal models must adequately explain historical price variation, capture both the magnitude and changes in the composition of potential concentrations, and be robust to adverse market environments. The population of risk exposures represented in the data used for estimation must be closely matched to or at least comparable with those of the bank's equity exposures.
- (d) Banks may also use modelling techniques such as historical scenario analysis to determine minimum capital requirements for banking book equity holdings. The use of such models is conditioned upon the institution demonstrating to its supervisor that the methodology and its output can be quantified in the form of the loss percentile specified under a).
- (e) Institutions must use an internal model that is appropriate for the risk profile and complexity of their equity portfolio. Institutions with material holdings with values that are highly non-linear in nature (e.g. equity derivatives, convertibles) must employ an internal model designed to capture appropriately the risks associated with such instruments.
- (f) Subject to supervisory review, equity portfolio correlations can be integrated into a bank's internal risk measures. The use of explicit correlations (e.g. utilisation of a variance/covariance VaR model) must be fully documented and supported using empirical analysis. The appropriateness of implicit correlation assumptions will be evaluated by supervisors in their review of model documentation and estimation techniques.
- (g) Mapping of individual positions to proxies, market indices, and risk factors should be plausible, intuitive, and conceptually sound. Mapping techniques and processes should be fully documented, and demonstrated with both theoretical and empirical evidence to be appropriate for the specific holdings. Where professional judgement is combined with quantitative techniques in estimating a holding's return volatility, the judgement must take into account the relevant information not considered by the other techniques utilised.
- (h) Where factor models are used, either single or multi-factor models are acceptable depending upon the nature of an institution's holdings. Banks are expected to ensure that the factors are sufficient to capture the risks inherent in the equity portfolio. Risk factors should correspond to the appropriate equity market

characteristics (for example, public, private, market capitalisation industry sectors and sub-sectors, operational characteristics) in which the bank holds significant positions. While banks will have discretion in choosing the factors, they must demonstrate through empirical analyses the appropriateness of those factors, including their ability to cover both general and specific risk.

- (i) Estimates of the return volatility of equity investments must incorporate relevant and available data, information, and methods. A bank may utilise independently reviewed internal data or data from external sources (including pooled data). The number of risk exposures in the sample, and the data period used for quantification must be sufficient to provide the bank with confidence in the accuracy and robustness of its estimates. Institutions should take appropriate measures to limit the potential of both sampling bias and survivorship bias in estimating return volatilities.
- (j) Banks that use the internal models approach to compute a capital charge for equity positions in the banking book are expected to have in place a rigorous and comprehensive stress-testing program. Banks are expected to subject their internal model and estimation procedures, including volatility computations, to either hypothetical or historical scenarios that reflect worst-case losses given underlying positions in both public and private equities. At a minimum, stress tests should be employed to provide information about the effect of tail events beyond the level of confidence assumed in the internal models approach.

(iii) *Risk management process and controls*

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

- (a) Full integration of the internal model into the overall management information systems of the institution and in the management of the banking book equity portfolio. Internal models should be fully integrated into the institution's risk management infrastructure including use in: 1) establishing investment hurdle rates and evaluating alternative investments; 2) measuring and assessing equity portfolio performance (including the risk-adjusted performance); and 3) allocating economic capital to equity holdings and evaluating overall capital adequacy as required under Pillar two. The institution should be able to demonstrate, through for example, investment committee minutes, that internal model output plays an essential role in the investment management process.
- (b) Established management systems, procedures, and control functions for ensuring the periodic and independent review of all elements of the internal modelling process, including approval of model revisions, vetting of model inputs, and review of model results, such as direct verification of risk computations. Proxy and mapping techniques and other critical model components should receive special attention. These reviews should assess the accuracy, completeness, and appropriateness of model inputs and results and focus on both finding and limiting potential errors associated with known weaknesses and identifying unknown model weaknesses. Such reviews may be conducted as part of internal or external audit programs, by an independent risk control unit, or by an external third party.

- (c) Adequate systems and procedures for monitoring investment limits and the risk exposures of equity investments.
- (d) The units responsible for the design and application of the model must be functionally independent from the units responsible for managing individual investments.
- (e) Parties responsible for any aspect of the modelling process must be adequately qualified. Management must allocate sufficient skilled and competent resources to the modelling function.

(iv) Validation and documentation

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

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

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

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

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

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

483. To facilitate model validation through back-testing on an ongoing basis, institutions using the internal model approach must construct and maintain appropriate data bases on the actual quarterly performance of their equity investments as well on the estimates derived

using their internal models. Institutions should also back-test the volatility estimates used within their internal models and the appropriateness of the proxies used in the model. Supervisors may ask banks to scale their quarterly forecasts to a different, in particular shorter, time horizon, store performance data for this time horizon and perform backtests on this basis.

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

- (a) A bank must document the rationale for its choice of internal modelling methodology and must be able to provide analyses demonstrating that the model and modelling procedures are likely to result in estimates that meaningfully identify the risk of the bank's equity holdings. Internal models and procedures must be periodically reviewed to determine whether they remain fully applicable to the current portfolio and to external conditions. In addition, a bank must document a history of major changes in the model over time and changes made to the modelling process subsequent to the last supervisory review. If changes have been made in response to the bank's internal review standards, the bank must document that these changes are consistent with its internal model review standards.
- (b) In documenting their internal models banks should:
 - provide a detailed outline of the theory, assumptions and/or mathematical and empirical basis of the parameters, variables, and data source(s) used to estimate the model;
 - establish a rigorous statistical process (including out-of-time and out-of-sample performance tests) for validating the selection of explanatory variables; and
 - indicate circumstances under which the model does not work effectively.
- (c) Where proxies and mapping are employed, institutions must have performed and documented rigorous analysis demonstrating that all chosen proxies and mappings are sufficiently representative of the risk of the equity holdings to which they correspond. The documentation should show, for instance, the relevant factors (e.g. business lines, balance sheet characteristics, geographic location, company age, industry sector and subsector, operating characteristics) used in mapping individual investments into proxies. In summary, institutions must demonstrate that the proxies and mappings employed:
 - Are adequately comparable to the underlying holding or portfolio;
 - Are derived using historical economic and market conditions that are relevant to the underlying holdings or, where not, that an appropriate adjustment has been made; and,
 - Are robust estimates of the potential risk of the underlying holding.

11. Disclosure requirements

485. In order to be eligible for the IRB approach, banks must meet the disclosure requirements set out in Pillar 3 (to be specified in the Third Consultative Document). These are minimum requirements for use of IRB: failure to meet these will render banks ineligible to use the relevant IRB approach.

IV. Credit Risk – Securitisation Framework

A. Scope and definitions of transactions covered under the securitisation framework

486. For the purpose of calculating regulatory capital requirements, transactions that satisfy a) and b), or a) and c), as well as d) of the following conditions are considered to be securitisations under the New Accord:

- (a) Transactions involving one or more underlying credit exposures from which stratified positions or tranches are created that reflect different degrees of credit risk. Such positions may take the form of a security or of an unfunded credit derivative;
- (b) Transactions where payments to investors depend upon the performance of specified underlying credit exposure(s), as opposed to being derived from an obligation (e.g. debt) of the entity originating those exposures. Such underlying credit exposures may include loans, commitments and receivables;
- (c) Transactions that involve credit derivative(s) where the investors' potential risk is dependent upon the performance of the underlying pool of credit exposure(s); and
- (d) Transactions that do not satisfy the definition of specialised lending as specified in paragraph 182 to 189.

487. Within this framework, credit exposures arising from all types of securitisations (i.e. traditional or synthetic) that satisfy the above-mentioned characteristics will be referred to as "securitisation exposures." Securitisation exposures can include, but are not restricted to, the following: asset-backed securities, mortgage-backed securities, credit enhancements, liquidity facilities, and credit derivatives provided to a securitisation exposure. This section also covers credit risk mitigation purchased for and provided to securitisation exposures.

488. The capital treatment for a securitisation exposure must be determined on the basis of the economic substance of the securitisation transaction rather than its legal form.

B. Definitions

1. Types of securitisations

(i) Traditional securitisations

489. A traditional securitisation involves the (economic) transfer of assets and other credit exposures through pooling and repackaging by a special purpose entity (SPE) into securities that can be sold to investors. This may be accomplished by legally isolating the underlying exposures from the originating bank or through sub-participation.

(ii) Synthetic securitisations

490. A synthetic securitisation generally involves the transfer of credit risk through the use of funded (e.g. credit-linked notes) or unfunded (e.g. credit default swaps) credit

derivatives or guarantees that serve to hedge the credit risk to which the originator is exposed.

(iii) Securitisation of revolving assets

491. Such securitisations involve underlying credit exposures wherein the borrower is permitted to vary the drawn amount within an agreed limit under a line of credit (e.g. credit card receivables and corporate loan commitments).

2. Different roles played by banks

(i) Investing bank

492. An investing bank is an institution, other than the originator, sponsor or servicer, that assumes the economic risk of a securitisation exposure.

(ii) Originating bank

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

(a) The bank originates directly or indirectly credit exposures included in a securitisation; or

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

(iii) Servicer bank

494. A servicer bank is one 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 securitisation exposures.

3. General terminology

(i) Clean-up call

495. A clean-up call is an option that permits an originating bank or a servicing bank to call the securitisation exposures (e.g. asset-backed securities) before all of the underlying credit 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. In the case of a synthetic transaction, the clean-up call may take the form of a clause that extinguishes the credit protection.

(ii) Credit enhancement

496. A credit enhancement is a contractual arrangement in which the bank retains or assumes a securitisation exposure and, in substance, provides some degree of added protection to other parties to the transaction. Credit enhancements may take various forms, some of which are listed as examples in the supervisory guidance pertaining to securitisation.

(iii) *Early amortisation*

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

- (a) The bank must have an appropriate capital/liquidity plan in place to ensure that it has sufficient capital and liquidity available in the event of an early amortisation.
- (b) Throughout the duration of the transaction there is a pro rata sharing of interest, principal, expenses, losses and recoveries based on the beginning of the month balance of receivables outstanding.
- (c) The bank must set a period for amortisation that would be sufficient for 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).

498. An early amortisation feature that does not satisfy the conditions for a controlled mechanism will be treated as a non-controlled feature.

(iv) *Excess spread*

499. Excess spread is defined as gross finance charge collections and other fee income received by the trust or special purpose entity (SPE) minus certificate interest, servicing fees, charge-offs, and other senior trust or SPE expenses. Finance charges may include market interchange fees.

(v) *Implicit support*

500. Implicit support arises when an institution provides support to a securitisation in excess of its predetermined contractual obligation.

K_{IRB}

501. K_{IRB} is the ratio of (a) the internal ratings-based (IRB) capital requirement for the underlying credit exposures to (b) the notional amount of credit exposures that have been securitised (i.e. the sum of drawn amounts plus undrawn commitments). Quantity (a) above must be calculated in accordance with the applicable minimum IRB standards (as set out in section III of this document) as if the securitised exposures were held directly by the bank. This calculation should reflect the effects of any credit risk mitigant that is applied on the underlying exposures (either individually or to the entire pool), and hence benefits all of the securitisation exposures. K_{IRB} is expressed in decimal form (e.g. a capital charge equal to 15% of the pool would be expressed as 0.15).

(vi) *Special purpose entity (SPE)*

502. A special purpose entity (SPE) is a corporation, trust, or other entity organised for a specific purpose, the activities of which are limited to those appropriate to accomplish the purpose of the SPE, and the structure of which is intended to isolate the SPE from the credit risk of an originator or seller of credit exposures. SPEs are commonly used as financing vehicles in which credit exposures are sold to a trust or similar entity in exchange for cash or other assets funded by debt issued by the trust.

C. Operational criteria for the recognition of risk transference

503. The following operational criteria are applicable to both the standardised and IRB approaches of the securitisation framework.

1. Operational criteria for traditional securitisations

504. An originating bank that transfers exposures it has originated may exclude securitised exposures from the calculation of risk-weighted assets if at a minimum the following conditions have been met. Banks meeting these conditions must still hold regulatory capital against any securitisation exposures they retain.

- (a) Significant credit risk associated with the securitised exposures has been transferred to third parties.
- (b) The transferor does not maintain effective or indirect control over the transferred exposures. The assets are legally isolated from the transferor in such a way (e.g. through the sale of assets or through subparticipation) that the credit exposures are therefore put beyond the reach of the transferor and its creditors, even in bankruptcy or receivership. These conditions must be supported by an opinion provided by a qualified legal counsel;
- (c) The securities issued are not obligations of the transferor. Thus, investors by purchasing the securities only have claim to the underlying pool of exposures;
- (d) The transferee is an SPE and the holders of the beneficial interests in that entity have the right to pledge or exchange them without restriction.
- (e) It will be determined that a transferor has maintained effective control over the transferred credit risk exposures if it: (i) is able to repurchase from the transferee the previously transferred credit exposures in order to realise their benefits; or (ii) is obligated to retain the risk of the transferred credit exposures. The transferor's retention of servicing rights to the credit exposures will not necessarily constitute indirect control of the exposures;
- (f) Any clean-up calls that are contractually permitted must satisfy the conditions outlined in paragraphs 506 to 511. Further, the clean-up calls must not be mandatory (i.e. they are to be exercised solely at the discretion of the bank) and cannot be used to provide credit support; and
- (g) The securitisation does not contain clauses that (i) require the originating bank to alter systematically the underlying credit exposures such that the pool's weighted average credit quality is improved; (ii) allow for increases in a retained first loss position or credit enhancement provided by the originating bank after the transaction's inception; or (iii) increase the yield payable to parties other than the originating bank, such as investors and third-party providers of credit enhancements, in response to a deterioration in the credit quality of the underlying pool.

2. Operational criteria for use of synthetic securitisations

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

- (a) Credit risk mitigants must comply with the requirements as set out in section II B.
- (b) Eligible collateral is limited to that specified in paragraph 108 and 109 of the standardised approach.
- (c) Eligible guarantors are limited to core market participants as defined in paragraph 159 of the standardised approach. Banks may not recognise SPEs as eligible guarantors in the securitisation framework;
- (d) Banks must transfer significant credit risk associated with the underlying credit exposure to third parties.
- (e) The instruments used to transfer credit risk may not contain terms or conditions that limit the amount of credit risk transferred, such as those provided below:
 - Clauses that materially limit the credit protection or credit risk transference (e.g. significant materiality thresholds below which credit protection is deemed not to be triggered even if a credit event occurs or those that allow for the termination of the protection due to deterioration in the credit quality of the underlying credit exposures);
 - Clauses that require the originating bank to alter the underlying credit exposures such that it can result in improvements to the pool's weighted average credit quality;
 - Clauses that increase the banks' cost of credit protection in response to deterioration in the pool's quality;
 - Clauses that increase the yield payable to parties other than the originating banks, such as investors and third-party providers of credit enhancements in response to a deterioration in the credit quality of the underlying pool; and
 - Clauses that provide for increases in a retained first loss position or credit enhancement provided by the originating bank after the transaction's inception.
- (f) An opinion must be obtained from a qualified legal counsel that confirms the enforceability of the contracts in all relevant jurisdictions.

3. *Operational requirements and treatment of clean-up calls*

506. Clean-up calls may be included in the contract only if they are not mandatory but exercised at the discretion of the originating bank and cannot be used to provide credit support. Further, they must only be executed when the cost of servicing the outstanding securities exceeds the benefits of servicing the underlying credit exposures. Securitisation transactions containing clean-up calls that can be used to purchase non-performing credit exposures will require the originator to treat exposures in the underlying pool as if they did not result in any risk transference. If a clean-up call, when exercised, is found to provide credit support, this action will be considered a form of implicit support provided by the bank and will be treated accordingly.

(i) Clean-up calls for traditional securitisations

507. A clean-up call is considered a credit enhancement if it can be exercised when more than 10 percent of the original nominal value of the transferred credit exposures or the original issuance of securities backed by the underlying credit exposures are outstanding. Where this is the case, the underlying exposures will be treated as if they had not been securitised.

508. Subject to the above operational criteria for the recognition of risk transference, clean-up calls on 10 percent or less of the original nominal value of the transferred exposures or original issuance of securities will not generate a capital requirement.

(ii) Clean-up calls for synthetic securitisations

509. Banks may only include clean-up calls in situations where specific protected credit risk exposures are referenced. In the case of a general reference to a category of claims against a given entity (referred to as “names”), the bank will be required to treat the underlying exposures as if there had not been any risk transference for capital purposes.

510. A clean up call is considered a credit enhancement if it can be exercised when more than 10 percent of the initially issued securitisation exposures (e.g. credit linked notes, credit default swaps) are outstanding. Where this is the case, the bank must hold capital against the entire amount of securitised exposures as if there was no credit protection.

511. Subject to the above operational criteria for the recognition of risk transference, clean-up calls on 10 percent or less of the initially issued securitisation exposures (e.g. credit-linked notes and credit default swaps) will not generate a capital requirement.

D. Treatment of Securitisation Exposures

1. Minimum Capital Requirement

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

(i) Deduction

513. When a bank is required to deduct a securitisation exposure from regulatory capital, the deduction will be taken 50% from Tier 1 and 50% from Tier 2 with one exception. Banks will be required to deduct from Tier 1 capital any expected future margin income (FMI) (e.g. interest-only strips receivable) that has been capitalised and carried as an asset on balance sheet and recognised in regulatory capital. Exposures of this type are referred to as “capitalised assets” for the purposes of the securitisation framework.

(ii) Implicit Support

514. When a banking organisation provides implicit support to one of its securitisations, it will be required, at a minimum, to hold capital against all of the exposures associated with the securitisation transaction as if they had not been securitised. Additionally, the bank is required to disclose publicly that (a) it has provided non-contractual support and (b) the capital impact of doing so.

2. Operational Criteria for Use of External Credit Assessments

515. The following operational criteria concerning the use of external credit assessments apply to the standardised and IRB approaches of the securitisation framework:

- (a) To be eligible for risk-weighting purposes, the external credit assessment must take into account and reflect the entire amount of credit risk exposure the bank has with

regard to all payments owed to it. For example, if a bank is owed both principal and interest, the assessment must fully take into account and reflect the credit risk associated with timely repayment of both principal and interest.

- (b) The external credit assessments must be from an eligible ECAI as recognised by the bank's national supervisory authority in accordance with paragraphs 52 to 70 with the following exception:
- Eligible external credit assessments will only include those that are available publicly to the market, meaning that the rating is of the type that is published in an accessible form and included in the rating agency's transition matrix. Accordingly, eligible assessments for securitisations do not include those that are only made available to domestic and foreign institutions with legitimate interests and at equivalent terms. In addition, "private ratings" will not qualify for this condition, even if they are available to all parties of the transaction.
- (c) Eligible ECAIs must have a demonstrated expertise in securitisations, which may be evidenced by strong market acceptance.
- (d) A bank is expected to apply external credit assessments from eligible ECAIs consistently across a given type of securitisation exposure. Further, a bank cannot use one institution's credit assessments for one or more tranches and another ECAI's credit assessment for other positions (whether retained or purchased) within the same securitisation structure that may or may not be rated by the first agency.
- (e) In cases where two or more eligible ECAIs can be used and these assess the credit risk of the same securitisation exposure differently, paragraphs 58 to 60 will apply.
- (e) The bank may not recognise an external credit assessment on a specific securitisation exposure (e.g. ABS tranche) if the external assessment reflects the benefits of a credit risk mitigant that has been provided only to that position. In such cases, the individual exposure will be treated as if it is unrated and the credit risk mitigation rules will be applied separately.

3. Standardised Approach for Securitisation Exposures

(i) Scope

516. Banks that apply the standardised approach to credit risk for the type of underlying exposure(s) securitised must use the standardised approach under the securitisation framework.

(ii) Risk Weights

517. The risk-weighted amount of a securitisation exposure is computed by multiplying the amount of the position by the appropriate risk weight determined in accordance with the following tables. For off-balance sheet exposures, banks must apply a credit conversion factor (CCF) and then risk weight the resultant credit equivalent amount. For positions with long-term ratings of B+ and below and for those that are unrated, deduction from capital will be required. Deduction is also required for positions with short-term ratings other than A1/P1, A2/P2, A3/P3 and those that are unrated.

518. The capital treatment of positions retained by originators; liquidity facilities; recognition of credit risk mitigants; and securitisations of revolving exposures are identified separately. The treatment of clean-up calls is provided in paragraphs 506 to 511.

Long-term rating category⁸²

External Credit Assessment	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to BB-	B+ and below or unrated
Risk Weight	20%	50%	100%	350%	Deduction

Short-term rating category

External Credit Assessment	A1/P1	A2/P2	A3/P3	All other ratings or unrated
Risk Weight	20%	50%	100%	Deduction

Investors may recognise ratings on below-investment grade exposures

519. Only third party investors, as opposed to banks that serve as originators in substance, may recognise external credit assessments that are equivalent to BB+ to BB- for risk weighting purposes of securitisation exposures.

Originators to deduct below-investment grade exposures

520. Originating banks as defined in paragraph 493 must deduct all retained securitisation exposures rated below investment grade (e.g. below BBB- using the illustrative external credit assessments provided above).

(iii) Exceptions to General Treatment of Unrated Securitisation Exposures

521. As noted in the earlier table, unrated securitisation exposures would normally be deducted. Exceptions to this rule apply to (a) unrated most senior securitisation exposures, and (b) exposures that are in a second loss position or better in ABCP programs and meet the requirements outlined in paragraph 524.

(a) Treatment of unrated most senior securitisation exposures in securitisations

522. If the most senior securitisation exposure of a traditional or synthetic securitisation is unrated, a bank that holds or guarantees such an exposure may apply the “look-through” treatment provided the composition of the underlying pool is known at all times.

523. In the look-through treatment, the notional amount of the unrated most senior position will receive the average risk weight assigned to the underlying credit exposures subject to supervisory review. Where the bank is unable to determine the risk weights assigned to the underlying credit risk exposure(s), the unrated position must be deducted.

⁸² The rating designations used in the following charts are for illustrative purposes only and do not indicate any preference for, or endorsement of, any particular external assessment system.

(b) *Treatment of exposures that are in a second loss position or better in ABCP programs*

524. Deduction is not required for unrated, securitisation exposures provided by sponsoring banks to ABCP programs that satisfy the following requirements:

- (a) The exposure is economically in a second loss position or better and the first loss position must provide significant credit protection to the second loss position;
- (b) The associated credit risk must be the equivalent of investment grade or better; and
- (c) The institution holding the unrated securitisation exposure must not retain or provide the first loss position.

525. Where these conditions are satisfied, banks will apply a risk weight that is the greater of (i) 100% or (ii) the highest risk weight assigned to any of the underlying individual credit exposures covered by the facility.

(c) *Risk weights for eligible liquidity facilities*

526. For securitisation exposures meeting the criteria listed in paragraphs 528 to 529, the risk weight applied to the exposure's credit equivalent amount is equal to the highest risk weight assigned to any of the underlying individual credit exposures covered by the eligible liquidity facility.

(iv) *Credit Conversion Factors for Off-balance Sheet Exposures*

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

(a) *Eligible liquidity facilities*

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

- (a) The facility must clearly identify and limit the circumstances under which it may be drawn. In particular, the facility must not be used to provide credit support, cover losses sustained (e.g. acquire assets at above fair value) or serve as permanent funding for the securitisation;
- (b) Draws on the facility (i.e. assets acquired under a purchase agreement or loans made under a lending agreement) must not be subordinated to the interests of investors and the fee charged for the facility should not be subordinated or subject to waiver or deferral;
- (c) The facility cannot be drawn after the program's credit enhancements from which the liquidity facility would benefit have been exhausted;
- (d) The facility must include an asset quality test that precludes it from being drawn to cover deteriorated credit risk exposures (e.g. those that are past due or defaulted); and

- (e) The facility must include a provision that results in an automatic corresponding reduction in the amount that can be drawn or in the termination of the facility when the average quality of the pool falls below investment grade.

529. Where these conditions are met, the bank may apply a 20% CCF to the amount of eligible liquidity facilities with an original maturity of one year or less, or a 50% CCF if the facility has an original maturity of more than one year.

(b) Eligible liquidity facilities available only in the event of market disruption

530. Banks may apply a 0% CCF to eligible liquidity facilities that are only available in the event of a general market disruption (i.e. where a capital market instrument cannot be issued at any price). To qualify for this treatment, the conditions provided in paragraph 528 must be satisfied. Additionally, the funds advanced by the bank to pay holders of the capital market instruments (e.g. commercial paper) when there is a general market disruption must be secured by the underlying assets, and must rank at least pari passu with the claims of holders of the capital market instruments.

(c) Eligible servicer cash advance facilities

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

(v) Recognition of Credit Risk Mitigants

532. The treatment below applies to a bank that has obtained a credit risk mitigant on a securitisation exposure. Credit risk mitigants include guarantees, credit derivatives, collateral and on-balance sheet netting. Collateral in this context refers to that used to hedge the credit risk of a securitisation exposure rather than the underlying credit exposures of the securitisation transaction.

533. When a bank other than an originator provides credit protection to a securitisation exposure, it must calculate a capital requirement on the covered exposure as if it were an investor. If a bank provides protection to an unrated credit enhancement, it must treat the credit protection provided as if it were directly holding the unrated credit enhancement.

(a) Collateral

534. Eligible collateral is limited to that recognised under the standard approach for credit risk mitigation (paragraphs 108 and 109).

(b) Guarantees and credit derivatives

535. Credit protection provided by the entities listed in paragraph 159 may be recognised. Special purpose entities will not be recognised as eligible guarantors.

536. Where guarantees or credit derivatives fulfil the minimum operational conditions as specified in paragraphs 154 to 158, banks can take account of such credit protection in calculating capital requirements on securitisation exposures.

537. Capital requirements for the guaranteed/protected portion will be calculated according to CRM for Standardised Approach as specified under paragraphs 160 to 165.

(c) *Maturity mismatches*

538. For the purpose of setting regulatory capital against a maturity mismatch, the capital requirement will be determined in accordance with paragraphs 166 to 168.

539. Maturity mismatches may arise in the context of synthetic securitisations when, for example, a bank uses credit derivatives to transfer the credit risk of a specified pool of assets to third parties. When the credit derivatives unwind, the transaction will terminate. Therefore, the effective maturity of the tranches of the synthetic securitisation will differ from that of the underlying exposures. Originating banks must treat such maturity mismatches in the following manner. The bank must deduct all retained positions that are unrated or rated below investment grade. For all other retained securitisation positions, the bank must apply the maturity mismatch treatment set forth in paragraph 166 to 168.

(vi) *Capital Requirement for Early Amortisation Provisions*

Scope

540. An originating bank will be required to apply the methodology described below to its off-balance sheet exposures when:

- (a) It sells credit exposures into a structure that contains an early amortisation feature; and
- (b) The credit exposures sold are of a revolving nature (i.e. lines of credit where draws and repayments can vary).

541. The bank will be required to hold capital against the sum of the originator's interest and the investors' interest arising from a securitisation of revolving credits that contains an early amortisation feature, as discussed in paragraph 546.

542. For securitisation structures wherein the underlying pool comprises revolving and term credit exposures, a bank must apply the relevant early amortisation treatment (outlined below in paragraphs 547 to 557) to that portion of the underlying pool containing revolving retail credit exposures.

Exemptions from early amortisation treatment

543. Replenishment structures where the underlying credit exposures do not revolve and the early amortisation ends the ability of the bank to add new exposures are not covered by this section and would not receive an additional capital charge under the early amortisation treatment.

544. Transactions of revolving assets containing early amortisation features that mimic term structures (i.e. where the risk on the underlying facilities does not return to the originating bank) are also excluded from this treatment. Further, structures where a bank securitises one or more credit line(s) for which investors remain fully exposed to future draws by borrowers even after an early amortisation event has occurred are exempt from the early amortisation treatment.

Maximum capital requirement

545. For a bank subject to the early amortisation treatment, the total capital charge for all of its positions will be subject to a maximum capital charge (i.e. a 'cap') equal to the greater of (i) that required for retained securitisation exposures, or (ii) the capital requirement that would apply had the exposures not been securitised. Deduction of any capitalised assets (e.g. future margin income), if any, will be treated outside this maximum limit.

Mechanics

546. As indicated in paragraph 541, a bank will be required to hold capital against the sum of the originator's interest and the investors' interest arising from a securitisation of revolving credits that contain an early amortisation feature. The capital charge for the originator's interest should be determined in accordance with the treatment outlined in paragraph x. The capital charge for the investors' interest is determined by multiplying the notional amount of such exposures by the product of (a) the appropriate CCF (as discussed below), and (b) the risk weight appropriate to the underlying exposure type, as if the credit exposures had not been securitised. The credit conversion factors differ depending upon whether the early amortisation repays investors through a controlled or non-controlled mechanism. They also differ according to whether the securitised exposures are uncommitted retail credit lines (e.g. credit card receivables) or other credit lines (e.g. revolving corporate facilities). The uncommitted lines must be unconditionally cancellable without prior notice.

(vii) Controlled Early Amortisation Features

Uncommitted retail exposures

547. An early amortisation feature will be considered controlled when the definition as specified in paragraph 497 is satisfied.

Mechanics

548. For uncommitted retail credit lines (e.g. credit card receivables) in securitisations containing controlled early amortisation features, banks must compare the three-month average of the following two reference excess spread levels:

- (a) The point at which the bank is required to trap excess spread as economically required by the structure; and
- (b) The excess spread level at which an early amortisation is triggered.

549. In cases where such a transaction does not require excess spread to be trapped, the first trapping point is deemed to be 4.5 percentage points greater than the excess spread level at which an early amortisation is triggered.

550. The bank must divide the distance between the two points described above into four equal segments. For example if the spread trapping point is 4.5% and the early amortisation trigger is 0%, then 4.5% is divided into four equal segments of 112.5 basis points each. The following conversion factors, based on illustrative segments, apply.

Controlled early amortisation features

	Uncommitted	Committed
Retail credit lines	3-month average excess spread Credit Conversion Factor (CCF)	80% CCF
	450 basis points (bp) or more 0% CCF	
	less than 450 bp to 337.5 bp 1% CCF	
	less than 337.5 bp to 225 bp	

	2% CCF less than 225 bp to 112.5 bp	
	20% CCF less than 112.5 bp	
	40% CCF	
Non-retail credit lines	80% CCF	80% CCF

551. Banks using the standardised approach to credit risk are required to apply the conversion factors outlined above for controlled mechanisms to the securitised off-balance sheet receivables (e.g. credit card receivables).

Other exposures

552. 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 credit conversion factor of 80% against the off-balance sheet exposures.

(viii) Non-controlled Early Amortisation Features

553. 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

554. For uncommitted retail credit lines (e.g. credit card receivables) in securitisations containing non-controlled early amortisation features, banks must compare the three-month average of the following two reference excess spread levels:

- The point at which the bank is required to trap excess spread as economically required by the structure; and
- The excess spread level at which an early amortisation is triggered.

555. In cases where such a transaction does not require excess spread to be trapped, the first trapping point is deemed to be 4.5 percentage points greater than the excess spread level at which an early amortisation is triggered.

556. The bank must divide the distance between the two points described above into four equal segments. For example if the spread trapping point is 4.5% and the early amortisation trigger is 0%, then 4.5% is divided into four equal segments of 112.5 basis points each. The following conversion factors, based on illustrative segments, apply.

Non-controlled early amortisation features

	Uncommitted	Committed
Retail credit lines	3-month average excess spread Credit Conversion Factor (CCF) 450 basis points (bp) or more 0% CCF	100% CCF

	less than 450 bp to 337.5 bp 5% CCF less than 337.5 bp to 225 bp 10% CCF less than 225 bp to 112.5 bp 50% CCF less than 112.5 bp 100% CCF	
Non-retail credit lines	100% CCF	100% CCF

Other exposures

557. All other securitised revolving exposures (i.e. those that are committed and all non-retail credit exposures) with non-controlled early amortisation features will be subject to a credit conversion factor of 100% against the off-balance sheet exposures.

4. Internal Ratings-Based Approach for Securitisations

(i) Scope

558. Under the IRB approach for securitisations there are two methods for calculating capital requirements for securitisation positions: the Supervisory Formula Approach (SFA) and the Ratings-Based Approach (RBA). Banks that have received approval to use the IRB approach for the type of underlying credit exposure(s) securitised (e.g. for their corporate, retail, or specialised lending portfolio) must use either the SFA or the RBA, as indicated below, when determining the capital requirements on securitisation positions backed by such exposures. Conversely, banks may not use the SFA or RBA unless they receive approval to do so for the underlying exposures from their national supervisors.

559. With the exception of eligible liquidity facilities only available in the event of a general market disruption (see paragraph 584) and servicer cash advances, securitisation exposures are to be treated using either the SFA or RBA as appropriate.

(ii) Hierarchy of Approaches

Originating banks

560. Originating banks are required to calculate K_{IRB} . Positions retained or repurchased by the originating bank with credit enhancement levels (i.e. values of L discussed in paragraph 578) of less than or equal to K_{IRB} must be deducted from regulatory capital.

561. If the originating bank holds a tranche that straddles the K_{IRB} border, it must treat the exposure as two separate positions. The portion of the tranche that is below or equal to K_{IRB} must be deducted from regulatory capital. The bank would apply the RBA to the portion that falls above K_{IRB} if there is an external rating or one that can be inferred. If not, the SFA would apply. Otherwise, the position must be deducted.

562. For positions beyond K_{IRB} , when either an external rating or an inferred rating is available, the originating bank is required to apply the RBA in determining an exposure's

capital requirement. Where an external or an inferred rating is not available, the capital requirement must be determined using the SFA. Otherwise, the position must be deducted.

563. The treatment for originating banks also applies to banks other than originators that receive supervisory approval to use the SFA for any portion of the securitisation in question.

Investing banks

564. Banks that are not originators and where paragraph 493 does not apply must use the RBA to determine the capital requirement on securitisation exposures for which an external or an inferred rating is available. Otherwise the position must be deducted or with supervisory approval the bank may calculate K_{IRB} , and, in turn, use the supervisory formula to determine the capital requirements.

(iii) Maximum Capital Requirement

565. For originators and other banks that receive supervisory approval to use the SFA (which requires calculation of K_{IRB} for the underlying pool), the total capital requirement against all exposures associated with the same securitisation transaction (excluding 'capitalised assets') will be capped at (i.e. will not exceed) the IRB capital requirement for the underlying pool of exposures. The cap amount is equal to the IRB capital charge that would be applied if the underlying securitised exposures were held directly on the bank's balance sheet, which would equal K_{IRB} times the nominal amount of credit exposures that have been securitised.

(iv) Rating Based Approach (RBA)

566. Under the RBA, the risk-weighted assets are determined by multiplying the amount of the exposure by the appropriate ABS risk weights, provided in the tables below.

567. The ABS risk weights depend on (i) the external rating grade or an available inferred rating, (ii) whether the credit assessment (external or inferred) represents a long-term or a short-term credit rating, (iii) the granularity of the underlying pool and (iv) the high-level seniority of the position relative to the size of the pool (denoted as "Q").

568. Q is defined as the total size of all positions rated at least AA- that are not more senior than the tranche of interest, measured relative to the size of the pool and expressed as a decimal.

569. The ABS risk weights provided in the first table below apply when the external assessment represents a long-term credit rating, as well as when an inferred rating based on a long-term rating is available.

570. Banks may apply the risk weight for highly-rated thick tranches backed by highly granular pools (column 2 of the first table below) if the effective number of underlying exposures (N) (defined in paragraph (96)) is 100 or more and the seniority of the position relative to the size of the pool ("Q") is greater than or equal to $0.1 + 25/N$ (i.e. $Q \geq 0.1 + 25/N$). When the effective number of underlying exposures comprises less than 32 exposures the risk weights in column 4 of the first table below must be applied. In all other cases, the risk weights in column 3 of the first table below apply.

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

External Rating (Illustrative)	Risk weights for thick tranches backed by highly granular pools	Base risk weights	Risk weights for tranches backed by non-granular pools
Aaa	7%	12%	20%
Aa	10%	15%	25%
A	20%	20%	35%
Baa1	50%	50%	50%
Baa2	75%	75%	75%
Baa3	100%	100%	100%
Ba1	250%	250%	250%
Ba2	425%	425%	425%
Ba3	650%	650%	650%
Below Ba3 and unrated	Deduction	Deduction	Deduction

571. The ABS risk weights in the table below apply when the external assessment represents a short-term credit rating, as well as when an inferred rating based on a short-term rating is available. The decision rules outlined in paragraph 570 also apply for short-term credit ratings.

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

External Rating (Illustrative)	Risk weights for thick tranches backed by highly granular pools	Base risk weights	Risk weights for tranches backed by non-granular pools
A1/P1	7%	12%	20%
A2/P2	20%	20%	35%
A3/P3	75%	75%	75%
All other ratings/unrated	Deduction	Deduction	Deduction

Use of Inferred Ratings

572. When the following minimum operational requirements are satisfied a bank *must* attribute an inferred rating to an unrated position. These requirements are intended to ensure that the unrated position is senior in *all* respects to an externally rated securitisation exposure (e.g. termed the 'reference securitisation exposure').

Operational requirements for inferred ratings

- (a) The reference securitisation exposure (e.g. ABS) must be subordinate in *all* respects to the unrated securitisation exposure. Credit enhancements, if any, must be taken into account when assessing the relative subordination of the unrated exposure and reference exposure. For example, if the reference securitisation exposure benefits from any third party guarantees or other credit enhancements that are not available to the unrated exposure, then the latter may not be assigned an inferred rating.

- (b) The maturity of the reference securitisation exposure must be equal to or longer than that of the unrated exposure.
- (c) On an ongoing basis, any inferred rating must be updated continuously to reflect any changes in the external rating of the reference securitisation exposure.
- (d) The external rating of the reference securitisation exposure must satisfy the general requirements for recognition of external ratings as delineated in the standardised approach to credit risk.
- (v) *Supervisory Formula Approach (SFA)*

573. Under the SFA, risk-weighted assets are calculated by multiplying the capital charge by 12.5. The capital charge for a securitisation tranche depends on five bank-supplied inputs: the IRB capital charge were the underlying securitised exposures held directly on the bank's balance sheet (K_{IRB}); the tranche's credit enhancement level (L) and thickness (T); the pool's effective number of loans (N); and the pool's exposure-weighted average loss-given-default (LGD). Given these inputs, all of which are defined below, the IRB capital charge for the securitisation tranche is as follows:

- (1) *IRB capital charge* = (S [L+T] – S [L]) times the notional amount of credit exposures that have been securitised,

where the function S[.] (termed the 'Supervisory Formula') is defined in the following paragraph. When the bank holds only a proportional interest in the tranche, that position's capital charge equals the prorated share of the capital charge for the entire tranche.

574. The Supervisory Formula is given by the following expression:

- (2)

$$S[L] = \left\{ \begin{array}{ll} L & \text{when } L \leq Kirb \\ Kirb + K[L] - K[Kirb] + (d \cdot Kirb / \omega)(1 - e^{\omega(Kirb-L)/Kirb}) & \text{when } Kirb < L \leq L^* \\ Kirb + K[L^*] - K[Kirb] + (d \cdot Kirb / \omega)(1 - e^{\omega(Kirb-L^*)/Kirb}) + (L - L^*) Floor & \text{when } L > L^* \end{array} \right\}$$

where

$$\begin{aligned}
h &= (1 - Kirb / LGD)^N \\
c &= Kirb / (1 - h) \\
v &= \frac{(LGD - Kirb) Kirb + 0.25(1 - LGD) Kirb}{N} \\
f &= \left(\frac{v + Kirb^2}{1 - h} - c^2 \right) + \frac{(1 - Kirb) Kirb - v}{(1 - h) \tau} \\
g &= \frac{(1 - c)c}{f} - 1 \\
a &= g \cdot c \\
b &= g \cdot (1 - c) \\
d &= 1 - (1 - h) \cdot (1 - Beta[Kirb; a, b]) \\
K[L] &= (1 - h) \cdot ((1 - Beta[L; a, b]) L + Beta[L; a + 1, b] c).
\end{aligned}$$

and L^* solves the following non-linear equation:

$$Floor = (1 - h) \cdot (1 - Beta[L^*; a, b]) + de^{\omega(Kirb - L^*) / Kirb}.$$

575. In these expressions, Beta [L; a, b] refers to the cumulative beta distribution with parameters a and b evaluated at L.⁸³

576. The supervisory-determined parameters in the above expressions are as follows:

Floor = 0.0056 (the lowest capital charge applicable under the RBA), $\tau = 1000$, and $\omega = 20$.

K_{IRB}

577. K_{IRB} is defined in paragraph 501. Calculation of K_{IRB} must be done in accordance with the minimum requirements set forth in section III Credit risk - the Internal Ratings-based approach.

Credit enhancement level (L)

578. L is measured (in decimal form) as the ratio of (a) the notional amount of all securitisation exposures subordinate to the tranche in question to (b) the notional amount of credit exposures that have been securitised. Banks will be required to determine L before considering the effects of any tranche-specific credit enhancements, such as third party guarantees that benefit only a single mezzanine tranche. Capitalised assets must not be included in the measured L.

Thickness of exposure (T)

579. T is measured as the ratio of (a) the nominal size of the tranche of interest to (b) the notional amount of credit exposures that have been securitised.

⁸³ The cumulative beta distribution function is available in Excel as the function BETADIST.

Effective number of exposures (N)

580. Multiple exposures to one obligor must be consolidated. The effective number of exposures is calculated as:

$$(3) \quad N = \frac{(\sum_i EAD_i)^2}{\sum_i EAD_i^2}$$

where EAD_i represents the exposure-at-default associated with all exposures to the i^{th} obligor.

Exposure-weighted average loss-given-default (LGD)

581. The exposure-weighted average loss-given-default is calculated as follows:

$$(4) \quad LGD = \frac{\sum_i LGD_i \cdot EAD_i}{\sum_i EAD_i}$$

where LGD_i represents the average loss-given-default associated with all exposures to the i^{th} obligor.

Simplified Method for Computing N and LGD

582. For securitisations involving retail exposures, subject to supervisory review, the SFA may be implemented using the simplifications: $h = 0$ and $v = 0$.

583. Under the conditions provided below, banks may employ a simplified method for calculating the effective number of loans and the exposure-weighted average LGD. Let C_m in the simplified calculation denote the share of the pool corresponding to the largest 'm' exposures (e.g., a 15% share corresponds to a value of 0.15). The level of m is to be set by each bank.

- If the portfolio share associated with the largest exposure, C_1 , is no more than 0.03 (or 3% of the underlying pool), then for purposes of the SFA the bank may set $LGD=0.50$ and N equal to the following amount

$$(5) \quad N = \left(C_1 C_m + \left(\frac{C_m - C_1}{m - 1} \right) \max\{1 - m C_1, 0\} \right)^{-1} .$$

- Alternatively, if only C_1 is available and this amount is no more than 0.03, then the bank may set $LGD=0.50$ and $N=1/ C_1$.

Eligible Liquidity Facilities Only Available in the Event of General Market Disruption

584. An eligible liquidity facility that is only drawn in the event of a general market disruption is assigned a 20% credit conversion factor (CCF) under the SFA. That is, an IRB bank is to recognise 20% of the capital charge generated under the SFA for the facility. If the eligible facility is externally rated, the bank may rely on the external rating under the RBA provided it assigns a 100% CCF rather than a 20% CCF to the facility.

Eligible Servicer Cash Advance Facilities

585. Eligible servicer cash advance facilities are to be handled in accordance with the standardised approach outlined in paragraph 531.

Recognition of Credit Risk Mitigants

586. Credit risk mitigants are to be recognised in the same manner as under the standardised approach to securitisation.

Capital Requirement for Early Amortisation Provisions

587. An originating bank must use the methodology and treatment described in paragraphs 547 to 557 for determining the capital charge for securitisations of revolving credits containing early amortisation provisions.

V. Operational risk

A. Definition of operational risk

588. 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.

B. The measurement methodologies

589. The framework outlined below presents three methods for calculating operational risk capital charges in a continuum of increasing sophistication and risk sensitivity: (i) the Basic Indicator Approach; (ii) the Standardised Approach; and (iii) Advanced Measurement Approaches.

590. Banks are encouraged to move along the spectrum of available approaches as they develop more sophisticated operational risk measurement systems and practices. Qualifying criteria for the Standardised and the Advanced Measurement Approaches are presented below.

591. Internationally active banks and banks with significant operational risk exposures are expected to use an approach that is proportionate to the risk profile faced by the institution. A bank will be permitted to use the [Basic Indicator or]⁸⁴ Standardised Approach for some business lines and an Advanced Measurement Approach for others, provided that all material risks are captured on a global, consolidated basis. A bank will not be allowed to choose to revert to simpler approaches once it has been approved for more advanced approaches.

⁸⁴ The RMG intends to look further at the issue of partial use including partial use of the Basic Indicator Approach in combination with the AMA.

1. **The Basic Indicator Approach**

592. Banks using the Basic Indicator Approach must hold capital for operational risk equal to a fixed percentage (denoted alpha) of average annual gross income over the previous three years. The charge may be expressed as follows:

$$K_{\text{BIA}} = \text{GI} \cdot \alpha$$

Where

K_{BIA} = the capital charge under the Basic Indicator Approach

GI = average annual gross income over the previous three years

α = [15%,] which is set by the Committee, relating the industry wide level of required capital to the industry wide level of the indicator. [Note: a precise value of alpha that will achieve the target of 12% of current MRC has yet to be established. However, a figure of 15% has been proposed as a basis for QIS3. This area remains work in progress and further analysis will need to be undertaken using the results of QIS3, and the operational risk loss data collection exercise, before a final value of alpha can be determined.]

593. Gross income is defined as net interest income plus net non-interest income.⁸⁵ It is intended that this measure (i) should be gross of any provisions (e.g. for unpaid interest); (ii) exclude realised and unrealised profits/losses from the sale of securities in the banking book;⁸⁶ (iii) exclude extraordinary or irregular items as well as income derived from insurance.

594. As a point of entry for capital calculation, no specific criteria for use of the Basic Indicator Approach are set out in the Rules. Nevertheless, banks using this approach are encouraged to comply with the Committee's guidance on *Sound Practices for the Management and Supervision of Operational Risk*, which was published as a consultative document in July 2002.

2. **The Standardised Approach**

595. In the Standardised Approach, banks' activities are divided into eight business lines: corporate finance, trading & sales, retail banking, commercial banking, payment & settlement, agency services, asset management, and retail brokerage. The business lines are defined in greater detail in Annex 6.

596. Within each business line, gross income is a broad indicator that serves as a proxy for the scale of business operations and thus the likely scale of operational risk exposure within each of these business lines. The capital charge for each business line is calculated by multiplying gross income by a factor (denoted beta) assigned to that business line. Beta serves as a proxy for the industry-wide relationship between the operational risk loss experience for a given business line and the aggregate level of gross income for that business line. It should be noted that in the Standardised Approach gross income is

⁸⁵ As defined by national supervisors and/or national accounting standards.

⁸⁶ Realised and unrealised profit/losses from securities classified as "held to maturity" and "available for sale", which typically constitute items of the banking book (e.g. under US or IASB accounting standards), are also excluded from the definition of gross income.

measured for each business line, not the whole institution, i.e. in corporate finance, the indicator is the gross income generated in the corporate finance business line.

597. The total capital charge is calculated as the simple summation of the regulatory capital charges across each of the business lines. The total capital charge may be expressed as:

$$K_{TSA} = \Sigma (GI_{1-8} * \beta_{1-8})$$

Where:

K_{TSA} = the capital charge under the Standardised Approach

GI_{1-8} = the average annual level of gross income over the past three years, as defined above in the Basic Indicator Approach, for each of the eight business lines

β_{1-8} = a fixed percentage, set by the Committee, relating the level of required capital to the level of the gross income for each of the eight business lines. The values of the betas are detailed below.

[Note: the precise values of the betas for individual business lines have yet to be decided. However, figures have been proposed as a basis for QIS3. This area remains work in progress and further analysis will need to be undertaken using the results of QIS3, and the operational risk loss data collection exercise, before final values for the betas can be determined.]

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%]

3. Advanced Measurement Approaches

598. Under the Advanced Measurement Approaches, the regulatory capital requirement will equal the risk measure generated by the bank’s internal operational risk measurement system using the quantitative and qualitative criteria for the Advanced Measurement Approaches discussed below.⁸⁷

Parallel calculation for banks adopting the advanced measurement approaches

⁸⁷ Regulators will review any capital numbers produced by an AMA for general credibility, especially in relation to a firm’s peers. In the event that credibility is lacking, action in either Pillar 1 or Pillar 2 will be considered. Some national supervisors may elect to impose specific internal measurement methods, or additional standards or criteria, that they deems necessary or appropriate for their institutions.

599. Banks adopting the advanced measurement approaches will be required to calculate their capital requirement using this approach as well as the existing Accord for a year prior to implementation of the New Accord at year-end 2006.

C. Qualifying criteria

1. General criteria

600. In order to qualify for use of the Standardised or Advanced Measurement Approaches a bank must satisfy its supervisory authority or authorities that, at a minimum:

- Its board of directors and senior management, as appropriate, are actively involved in the oversight of the operational risk management process.
- It has a risk management system that is conceptually sound and is implemented with integrity; and
- It has sufficient staff resources in the use of the approach in the major business lines as well as the control and audit areas.

601. Supervisory authorities will have the right to insist on a period of initial monitoring of a bank's Standardised Approach before it is used for supervisory capital purposes.

602. A bank's Advanced Measurement Approach will also be subject to a period of initial monitoring by its supervisory authority before it can be used for regulatory purposes. This period will allow the supervisory authority to determine whether the approach is credible and appropriate. As discussed below in the qualifying criteria for the Advanced Measurement Approaches, a bank's internal measurement system must reasonably estimate unexpected losses based on the combined use of internal loss data, scenario analysis, bank-specific business environment and internal control factors, and external data. The bank's measurement system must also support the allocation of economic capital for operational risk across business lines in a manner that creates incentives to improve business line operational risk management.

603. In addition to these general criteria, banks using the Standardised or Advanced Measurement Approaches for capital purposes will be subject to the qualitative and quantitative standards detailed in the sections below.

2. The Standardised Approach

604. As some internationally active banks will wish to use the Standardised Approach, it is important that such banks have adequate operational risk management systems. Consequently, an internationally active bank using the Standardised Approach must:

- (a) Be able to identify its exposures to operational risk as far as is reasonably possible. This will require 'bottom-up' identification exercises; analysis of products, activities, processes, and systems; new business procedures; and analysis of relevant external events. In addition, the process by which the bank's operational risk is identified must be reviewed periodically;
- (b) Assess the potential impact that operational risk might have on its solvency. This should include an understanding of the impact of both low-frequency, high-severity events and high-frequency, low-severity events. This assessment should be sufficient to give senior management and the board of directors a fair understanding of the potential impact of the bank's operational risk profile;

- (c) Be able to monitor its operational risk on an on-going basis. This may, for instance, involve the use of such tools as key performance indicators, thresholds and limits, or scorecards. Particular attention must be given to the monitoring of operational risk where normal internal processes and controls are not followed (eg, one-off transactions or activities);
- (d) Implement a system of management reporting that provides operational risk reports to relevant functions within the bank. These reports should alert management attention to potential exposures identified from predefined thresholds. The reports must cover exceptions to the bank's operational risk policy. A bank must have procedures for taking appropriate action according to the information within the management reports;
- (e) Build on its operational risk assessment framework and management reporting systems, to define and refine its operational risk appetite and communicate this in a consistent manner throughout the firm;
- (f) Create proper incentives by factoring operational risk into processes such as pricing and pay decisions; using its approach to operational risk as an integral part of its overall business strategy; and using insurance, where appropriate; and
- (g) Begin to systematically track relevant operational risk data, including material internal loss data, by business line.

Business line mapping

605. A bank must develop specific policies and have documented criteria for mapping gross income for current business lines and activities into the standardised framework. The criteria must be reviewed and adjusted for new or changing business activities and risks as appropriate. The principles for business line mapping are set out in Annex 6.

D. Advanced Measurement Approaches

1. Qualitative Standards

606. A bank must meet the following qualitative standards before it is permitted to use an Advanced Measurement Approach for operational risk capital:

- (a) The bank must have an independent operational risk management function that is responsible for the design and implementation of the bank's operational risk management framework. The operational risk management function is responsible for codifying firm-level policies and procedures concerning operational risk management and controls; for the design and implementation of the firm's operational risk measurement methodology; for the design and implementation of a risk-reporting system for operational risk; and for developing strategies to identify, measure, monitor and control operational risk.
- (b) The board of directors and senior management, as appropriate, must be actively involved in the oversight of the operational risk management process.
- (c) The bank's internal operational risk measurement system must be closely integrated into the day-to-day risk management processes of the bank. Its output must be an integral part of the process of monitoring and controlling the bank's operational risk profile. For instance, this information must play a prominent role in risk reporting, management reporting, internal capital allocation, and risk analysis. The bank must

have techniques for allocating operational risk capital to major business lines and for creating incentives to improve the management of operational risk throughout the firm.

- (d) There must be regular reporting of operational risk exposures and loss experience to business unit management, senior management, and to the board of directors.
- (e) The bank's risk management system must be well documented. The bank must have a routine in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operational risk management system, which must include policies for the treatment of non-compliance issues.
- (f) Internal and external auditors must perform regular reviews of the operational risk management processes and measurement systems. This review must include both the activities of the business units and of the independent operational risk management function.
- (g) The validation of the operational risk measurement system by external auditors and/or supervisory authorities must include the following:
 - Verifying that the internal validation processes are operating in a satisfactory manner; and
 - Making sure that data flows and processes associated with the risk measurement system are transparent and accessible. In particular, it is necessary that auditors and supervisory authorities are in a position to have easy access, whenever they judge it necessary and under appropriate procedures, to the system's specifications and parameters.

2. Quantitative Standards

(i) AMA Soundness Standard

607. Given the continuing evolution of analytical approaches for operational risk, the Committee is not specifying the approach or distributional assumptions used to generate the operational risk measure for regulatory capital purposes. However, a bank must be able to demonstrate that its approach captures potentially severe 'tail' loss events. This does not include catastrophic events that lie beyond the scope of any regulatory capital regime. Whatever approach is used, a bank must demonstrate that its operational risk measure meets a soundness standard comparable to that of the internal ratings based approach for credit risk, (ie comparable to a one year holding period and a 99.9 percent confidence interval).

608. The Committee recognises that the AMA soundness standard provides significant flexibility to banks in the development of an operational risk measurement and management system. However, in the development of these systems, banks must have and maintain rigorous procedures for operational risk model development and independent model validation. The Committee will review progress in regard to operational risk approaches by the end of 2006 in view of the evolution of industry practices that are sufficient to produce credible and consistent estimates of potential losses. It will also review accumulated data, and the level of capital requirements estimated by the AMA, and may refine its proposals if appropriate.

(ii) *Detailed criteria*

609. This section describes a series of quantitative standards that will apply to internally generated operational risk measures for purposes of calculating the regulatory minimum capital charge.

- (a) Supervisors will require the bank to calculate its regulatory capital requirement as the sum of expected loss (EL) and unexpected loss (UL), unless the bank can demonstrate that it is adequately capturing EL in its internal business practices. That is, to base the minimum regulatory capital requirement on UL alone, the bank must be able to demonstrate to the satisfaction of its national supervisor that it has measured its EL exposure and that this exposure is reflected in its reserves, pricing, or expensing practices, the particular approach depending on factors such as the frequency of losses and the applicable accounting standards.
- (b) A bank's risk measurement system must be sufficiently 'granular' so as to capture the major drivers of risk affecting the shape of the tail of the loss estimates.
- (c) The bank may be permitted to recognise empirical correlations in operational risk losses across individual operational risk estimates, provided it can demonstrate to a high degree of confidence that its systems for measuring correlations are sound, implemented with integrity, and take into account the uncertainty surrounding any such correlation estimates (particularly in periods of stress). The bank must validate its correlation assumptions using empirical analysis. In the absence of specific, valid correlation estimates, risk measures for different operational risk estimates must be added for purposes of calculating the regulatory minimum capital requirement.
- (d) Any risk measurement system must have certain key features to meet the supervisory soundness standard set out in this section. These elements must include the use of internal data, external data, scenario analysis and factors reflecting the business environment and internal control systems. A bank needs to have a credible, transparent, well-documented and verifiable process for determining the relative importance attached to each of these fundamental elements in its overall operational risk measurement system. The approach should be internally consistent and avoid the double counting of qualitative assessments or risk mitigants already recognised in other elements of the framework.

(iii) *Internal data*

610. Banks must track internal loss data according to the criteria set out in this section. The tracking of internal loss event data is an essential prerequisite to the development and functioning of a credible operational risk measurement system. Internal loss data are crucial for tying a bank's risk estimates to its actual loss experience. This can be achieved in a number of ways, including using internal loss data as the foundation of empirical risk estimates, as a means of validating the inputs and outputs of the bank's risk measurement system or as the link between loss experience and risk management and control decisions.

611. Internal loss data are most relevant when they are clearly linked to a bank's current business activities, technological processes and risk management procedures. Therefore, a bank must have documented procedures for assessing the on-going relevance of historical loss data, including those situations in which judgement overrides, scaling, or other adjustments may be used, to what extent they may be used and who is authorised to make such decisions.

612. Internally generated operational risk measures used for regulatory capital purposes must be based on a minimum historical observation period of five years, whether the data

are used directly to build the loss measure or to validate it. When the bank first moves to the AMA, a three-year historical data window is acceptable.

613. To qualify for regulatory capital purposes, a bank's internal loss collection processes must meet the following standards:

- Any internal operational risk measurement system must be consistent with the scope of operational risk defined by the Committee in paragraph 588 above.
- To assist in supervisory validation, a bank must be able to map its historical internal loss data into the supervisory categories defined in Annexes 6 and 7 and to provide these data to supervisors upon request. It must have documented, objective criteria for allocating losses to the specified business lines and event types. However, it is left to the bank to decide the extent to which it applies these categorisations in its internal operational risk measurement system.
- A bank's internal loss data must be comprehensive in that it captures all material activities and exposures from all appropriate sub-systems and geographic locations. A bank must be able to justify that any excluded activities or exposures, both individually and in combination, would not have a material impact on the overall risk estimates. A bank must have an appropriate *de minimis* gross loss threshold for internal loss data collection, for example [€10,000].
- Aside from information on gross loss amounts, a bank should collect information about the date of the event, any recoveries of gross loss amounts, as well as some descriptive information about the drivers or causes of the loss event. The level of detail of any descriptive information should be commensurate with the size of the gross loss amount.
- A bank must develop specific criteria for assigning loss data arising from an event in a centralised function (e.g., an information technology department) or an activity that spans more than one business line, as well as from related events over time.
- A bank must track the operational risk losses related to its market and credit activities (e.g., fraud in credit cards), consistent with the scope of the definition of operational risk set out above and the detailed loss event types outlined in Annex 7. The Committee does not plan to double count these losses for the purposes of determining a regulatory capital charge.

(iv) *External data*

614. A bank's operational risk measurement system must use relevant external data (either public data and/or pooled industry data), especially when there is reason to believe that the bank is exposed to infrequent, yet potentially severe, losses. These external data should include data on actual loss amounts, information on the scale of business operations where the event occurred, information on the causes and circumstances of the loss events or other information that would help in assessing the relevance of the loss event for other banks. A bank must have a systematic process for determining the situations for which external data must be used and the methodologies used to incorporate the data (e.g., scaling, qualitative adjustments, or informing the development of improved scenario analysis). The conditions and practices for external data use must be regularly reviewed, documented and subject to periodic independent review.

(v) *Scenario analysis*

615. A bank must use scenario analysis of expert opinion in conjunction with external data to evaluate its exposure to high severity events. This approach draws on the knowledge of experienced business managers and risk management experts to derive reasoned

assessments of plausible severe losses. For instance, these expert assessments could be expressed as parameters of an assumed statistical loss distribution. In addition, scenario analysis should be used to assess the impact of deviations from the correlation assumptions embedded in the bank's operational risk measurement framework, in particular, to evaluate potential losses arising from multiple simultaneous operational risk loss events. Over time, such assessments need to be validated and re-assessed through comparison to actual loss experience to ensure their reasonableness.

(vi) *Business environment and internal control factors*

616. In addition to using loss data, whether actual or scenario-based, a bank's firm-wide risk assessment methodology must capture key business environment and internal control factors that can change its operational risk profile. These factors will make a bank's risk assessments more forward-looking, more directly reflect the quality of the bank's control and operating environments, help align capital assessments with risk management objectives and recognise both improvements and deterioration in operational risk profiles in a more immediate fashion. To qualify for regulatory capital purposes, the use of these factors in a bank's risk measurement framework must meet the following standards:

- The choice of each factor needs to be justified as a meaningful driver of risk, involving the expert judgment of the affected business areas. Whenever possible, the factors should be translatable into quantitative measures that lend themselves to verification.
- The sensitivity of a bank's risk estimates to changes in the factors and the relative weighting of the various factors need to be well reasoned. In addition to capturing changes in risk due to improvements in risk controls, the framework must also capture potential increases in risk due to greater complexity of activities or increased business volume.
- The framework and each instance of its application, including the supporting rationale for any adjustments to empirical estimates, must be documented and subject to independent review within the bank and by supervisors.
- Over time, the process and the outcomes need to be validated through comparison to actual internal loss experience, relevant external data, and appropriate adjustments made.

(vii) *Risk mitigation*

617. Under the AMA, a bank will be allowed to recognise the risk mitigating impact of insurance in the measures of operational risk used for regulatory minimum capital requirements. The recognition of insurance mitigation will be limited to [10-25%] of the total operational risk capital charge.

618. A bank's ability to take advantage of such risk mitigation will depend on compliance with a set of strict eligibility criteria. *[A set of indicative criteria for recognising insurance mitigation is set out below. The Committee is currently developing these criteria in consultation with industry and welcomes further dialogue with market participants on this area. The criteria listed below are not intended to be comprehensive, but reflect some of the issues that the Committee has identified as particularly important.]*

- *A minimum claims paying ability rating for the insurance provider [e.g. A];*
- *A minimum residual maturity term [e.g. of no less than one year];*
- *A minimum notice period for cancellation of the contract [e.g. 90 days];*

- *The need for insurance to be provided by a third party entity. (In the case of insurance through captives and affiliates, the exposure would have to be laid off to an independent third party entity, for example through re-insurance, that met the eligibility criteria, and any such coverage would have to be explicitly mapped to the actual operational risk loss exposure of the institution.); and*
- *Disclosure requirements, including disclosure of the reduction of the operational risk capital charge due to insurance.*

A bank's methodology for recognising insurance under the AMA will also need to capture elements including:

- *The uncertainty of payment as well as mismatches in coverage of insurance policies and measured operational risk exposures;*
- *Potential concentration risks to insurance providers; and*
- *Potential liquidity risks associated with mismatches in the timing of payments on third party settlements and claims paid by insurers.*

The Committee also intends to consider the possibility of recognising other types of capital market instruments.]

VI. Trading book issues

A. Definition of the trading book

619. The following definition of the trading book replaces the present definition in the 1996 *Amendment to the Capital Accord to Incorporate Market Risks* (see Introduction – Section I, The risk measurement framework, paragraph 2).⁸⁸

620. A trading book consists of positions in financial instruments and commodities held either with trading intent or in order to hedge other elements of the trading book. To be eligible for trading book capital treatment, financial instruments must either be free of any restrictive covenants on their tradability or able to be hedged completely. In addition, positions should be frequently and accurately valued, and the portfolio should be actively managed.

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

⁸⁸ The trading book rules and principles spelled out in paragraphs 3 to 5 of the Introduction to the Market Risk Amendment remain unchanged.

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

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

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

624. A hedge is a position that materially or entirely offsets the component risk elements of another trading book position or portfolio.

B. Prudent valuation guidance

625. This section provides banks with guidance on prudent valuation for positions in the trading book. This guidance is especially important for less liquid positions which, although they will not be excluded from the trading book solely on grounds of lesser liquidity, raise supervisory concerns about prudent valuation.

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

1. Systems and controls

627. Banks must establish and maintain adequate systems and controls sufficient to give management and supervisors the confidence that their valuation estimates are prudent and

reliable. These systems must be integrated with other risk management systems within the organisation (such as credit analysis). Such systems must include:

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

2. Valuation methodologies

(i) Marking to market

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

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

(ii) Marking to model

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

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

- The model should be subject to periodic review to determine the accuracy of its performance (e.g. assessing continued appropriateness of the assumptions, analysis of P&L versus risk factors, comparison of actual close out values to model outputs).
- Valuation adjustments should be made as appropriate, for example, to cover the uncertainty of the model valuation (see also valuation adjustments).

(iii) Independent price verification

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

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

3. Valuation adjustments or reserves

633. Banks must establish and maintain procedures for considering valuation adjustments/reserves. Supervisory authorities expect banks using third-party valuations to consider whether valuation adjustments are necessary. Such considerations are also necessary when marking to model.

634. Supervisory authorities expect the following valuation adjustments/reserves to be formally considered at a minimum: unearned credit spreads, close-out costs, operational risks, early termination, investing and funding costs, and future administrative costs and where appropriate, model risk.

635. In addition, supervisory authorities will require banks to consider the need for establishing reserves for less liquid positions (and on an ongoing basis review their continued appropriateness). Reduced liquidity could arise from market events. Additionally, close-out prices for concentrated positions and/or stale positions are more likely to be adverse. Banks must consider several factors when determining whether a valuation reserve is necessary for less liquid items. These factors include the amount of time it would take to hedge out the position/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.

636. Valuation adjustments must impact regulatory capital.

C. Treatment of Credit Risk Mitigation in the Trading Book

637. Banks will be required to calculate the counterparty credit risk charge for all OTC derivatives and repo-style transactions booked in the trading book, separate from the capital

charge for general market risk and specific risk. The risk weights to be used in this calculation must be consistent with those used for calculating the capital requirements in the banking book. Thus standardised approach banks will use the standardised approach risk weights and IRB banks will use the IRB risk weights in a manner consistent with the IRB roll out situation in the banking book. For counterparties included in portfolios where the IRB approach is being used the IRB risk weights will have to be applied. The 50% cap on risk weights for OTC derivative transactions is abolished (See paragraph 49)

638. In the trading book, for repo-style transactions, all instruments which are included in the trading book may be used as eligible collateral. Those instruments which fall outside the banking book definition of eligible collateral shall be haircutted at the level applicable to non-main index equities listed on recognised exchanges (as noted in paragraph 114).

639. The calculation of the counterparty credit risk charge for collateralised OTC derivative transactions is the same as the rules prescribed for such transactions booked in the banking book.

640. The calculation of the counterparty charge for repo-style transactions will be conducted using the rules in paragraphs 110 to 145 spelled out for such transactions booked in the banking book.

Credit derivatives

641. When a bank conducts an internal hedge using a credit derivative (i.e. hedge the credit risk of an exposure in the banking book with a credit derivative booked in the trading book), in order for the bank to receive any reduction in the capital requirement for the exposure in the banking book, the credit risk in the trading book must be transferred out to an outside third party (i.e. an eligible protection provider). The banking book treatment for credit derivatives will be used to calculate the capital requirements for the hedged banking book position. For the credit derivative booked in the trading book, in principal, the capital charges for general market risk, specific risk will apply based on the Market Risk Amendment. The rules for specific risk offsets for credit derivatives booked in the trading book are presented in paragraphs 646-651. The counterparty credit risk charge will be calculated using the add-on factors specified in paragraph 652.

D. Trading book capital treatment for specific risk under the standardised methodology

642. The following sections describe the changes to the specific risk capital treatments under the standardised methodology within the trading book.⁸⁹ These changes are consistent with the changes in the banking book capital requirements under the standardised approach.

1. Specific risk capital charges for government paper

643. The new capital charges will be as follows.

External credit assessment	Specific risk capital charge
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⁸⁹ The specific risk capital charges for qualifying debt paper as set out in *the 1996 Amendment to the Capital Accord to Incorporate Market Risks* will remain unchanged.

AAA to AA-	0%
A+ to BBB-	0.25% (residual term to final maturity 6 months or less) 1.00% (residual term to final maturity greater than 6 and up to and including 24 months) 1.60% (residual term to final maturity exceeding 24 months)
All others	8.00%

644. When the government paper is denominated in the domestic currency and funded by the bank in the same currency, at national discretion a lower specific risk charge may be applied.

2. *Specific risk rules for unrated debt securities*

645. Under the current Market Risk Amendment unrated securities may be included in the “qualifying” category when they are subject to supervisory approval, unrated, but deemed to be of comparable investment quality by the reporting bank, and the issuer has securities listed on a recognised stock exchange. This will remain unchanged for banks using the Standardised Approach. For banks using the IRB approach for a portfolio, unrated securities can be included in the “qualifying” category if both of the following conditions are met:

- the securities are rated equivalent⁹⁰ to investment grade under the reporting bank’s internal rating system, which the national supervisor has confirmed complies with the Accord requirements for an IRB approach; and
- the issuer has securities listed on a recognised stock exchange.

3. *Specific risk capital charges for positions hedged by credit derivatives*

646. Full allowance will be recognised when the value of two legs (i.e. long and short) always move in the opposite direction and broadly to the same extent. This would be the case in the following situations:

- (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 (i.e. the cash position).⁹¹

In these cases, no specific risk capital requirement applies to both sides of the position.

647. An 80% offset will be recognised when the value of two legs (i.e. long and short) always moves in the opposite direction. This would be the case in the following situation:

⁹⁰ Equivalent means the debt security has a one-year PD equal to or less than the one year PD implied by the long run average one year PD of a security rated investment grade or better by a qualifying rating agency.

⁹¹ The maturity of the swap itself may be different from that of the underlying exposure.

- (a) a long cash position is hedged by a credit default swap or a credit linked note (or vice versa) and there is an exact match in terms of the reference obligation, the maturity of both the reference obligation and the credit derivative, and the currency to the underlying exposure. In addition, key features of the credit derivative contract (e.g. credit event definitions, settlement mechanisms) should not cause the price movement of the credit derivative to materially deviate from the price movements of the cash position.

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

648. Partial allowance will be recognised when the value of the two legs (i.e. 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 646 under (b), but there is an asset mismatch between the reference obligation and the underlying exposure. However, the position meets the requirements in paragraph 133g).
- (b) The position is captured in paragraph 646 under (a) or 647 but there is a currency or maturity mismatch⁹² between the credit protection and the underlying asset.
- (c) The position is captured in paragraph 647 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.

649. In each of these cases the following rule applies. Rather than adding the specific risk capital requirements for each side of the transaction (i.e. the credit protection and the underlying asset) only the higher of the two capital requirements will apply.

650. In all other cases a specific risk capital charge will be assessed against both sides of the position.

651. With regard to banks first-to-default and second-to-default products in the trading book, the basic concepts developed for the banking book will also apply. Banks holding long positions in these products (e.g. buyers of basket credit linked notes) would be treated as if they were protection sellers and would be required to add the specific risk charges or use the external rating if available. Issuers of these notes would be treated as if they were protection buyers and are therefore allowed to off-set specific risk for one of the underlyings, i.e. the asset with the lowest specific risk charge.

4. Add-on factor for credit derivatives

652. The add-on factor to cover potential future exposure for single name credit derivative transactions in the trading book is as follows.

⁹² Currency mismatches should feed into the normal reporting of foreign exchange risk.

	Protection buyer	Protection seller
Total Return Swap		
“qualifying” reference obligation	5%	5%
“Non-qualifying” reference obligation	10%	10%
Credit Default Swap		
“qualifying” reference obligation	5%	-
“Non-qualifying” reference obligation	10%	-

There will be no difference depending on residual maturity.

The definition of “qualifying” is the same as for the “qualifying” category for the treatment of specific risk under the standardised measurement method in the Market Risk Amendment.

653. 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, i.e. 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, i.e. the second lowest credit quality will determine the add-on for a second to default transaction etc.

Annex 1

The 15% of Tier 1 Limit on Innovative Instruments

1. This Annex is meant to clarify the calculation of the 15% limit on innovative instruments agreed by the Basel Committee in its press release of October 1998.
2. Innovative instruments will be limited to 15% of Tier 1 capital, net of goodwill. To determine the allowable amount of innovative instruments, banks and supervisors should multiply the amount of non-innovative Tier 1 by 17.65%. This number is derived from the proportion of 15% to 85%--i.e. $15\%/85\% = 17.65\%$.
3. As an example, take a bank with \$75 of common equity, \$15 of non-cumulative perpetual preferred stock, \$5 of minority interest in the common equity account of a consolidated subsidiary, and \$10 of goodwill. The net amount of non-innovative Tier 1 is $\$75 + \$15 + \$5 - \$10 = \$85$.
4. The allowable amount of innovative instruments this bank may include in Tier 1 capital is $\$85 \times 17.65\% = \15 . If the bank issues innovative Tier 1 instruments up to its limit, total Tier 1 will amount to $\$85 + \$15 = \$100$. The percentage of innovative instruments to total Tier 1 would equal 15%.

Annex 2

Standardised Approach - Implementing the Mapping Process

1. Because supervisors will be responsible for assigning eligible ECAI's credit risk assessments to the risk weights available under the standardised approach, they will need to consider a variety of qualitative and quantitative factors to differentiate between the relative degrees of risk expressed by each assessment. Such qualitative factors could include the pool of issuers that each agency covers, the range of ratings that an agency assigns, each rating's meaning, and each agency's definition of default, among others.
2. Quantifiable parameters may help to promote a more consistent mapping of credit risk assessments into the available risk weights under the standardised approach. This annex summarises the Committee's proposals to help supervisors with mapping exercises. The parameters presented below are intended to provide guidance to supervisors and are not intended to establish new or complement existing eligibility requirements for ECAs.

Evaluating CDRs: two proposed measures

3. To help ensure that a particular risk weight is appropriate for a particular credit risk assessment, the Committee recommends that supervisors evaluate the cumulative default rate ("CDR") associated with all issues assigned the same credit risk rating. Supervisors would evaluate two separate measures of CDRs associated with each risk rating contained in the standardised approach, using in both cases the CDR measured over a three-year period.
 - To ensure that supervisors have a sense of the long-run default experience over time, supervisors should evaluate the ten-year average of the three-year CDR when this depth of data is available.⁹³ For new rating agencies or for those that have compiled less than ten years of default data, supervisors may wish to ask rating agencies what they believe the 10-year average of the three-year CDR would be for each risk rating and hold them accountable for such an evaluation thereafter for the purpose of risk weighting the claims they rate.
 - The other measure that supervisors should consider is the most recent three-year CDR associated with each credit risk assessment of an ECAI
4. Both measurements would be compared to aggregate, historical default rates of credit risk assessments compiled by the Committee that are believed to represent an equivalent level of credit risk.
5. As three-year CDR data is expected to be available from ECAs, supervisors should be able to compare the default experience of a particular ECAI's assessments with those issued by other rating agencies, in particular major agencies rating a similar population.

⁹³ In 2002, for example, a supervisor would calculate the average of the three-year CDRs for issuers assigned to each rating grade (the "cohort") for each of the ten years 1990-1999.

Mapping risk ratings to risk weights using CDRs

6. To help supervisors determine the appropriate risk weights to which an ECAI’s risk ratings should be mapped, each of the CDR measures mentioned above could be compared to the following reference and benchmark values of CDRs:

- For each step in an ECAI’s rating scale, a ten-year average of the three-year CDR would be compared to a long run “reference” three-year CDR that would represent a sense of the long-run international default experience of risk assessments.
- Likewise, for each step in the ECAI’s rating scale, the two most recent three-year CDR would be compared to “benchmarks” for CDRs. This comparison would be intended to determine whether the ECAI’s most recent record of assessing credit risk remains within the CDR supervisory benchmarks.

7. Table 1 below illustrates the overall framework for such comparisons.

Table 1: Comparisons of CDR Measures⁹⁴

International Experience (derived from the combined experience of major rating agencies)	Compare to	External Credit Assessment Institution
<i>Set by the Basel Committee as guidance</i>		<i>Calculated by national supervisors based on the ECAI’s own default data</i>
Long-run “reference” CDR		Ten-year average of the three-year CDR
CDR Benchmarks		Two most recent three-year CDR

1. Comparing an ECAI’s long-run average three-year CDR to a long-run “reference” CDR

8. For each credit risk category used in the standardised approach of the New Basel Accord, the corresponding long-run reference CDR would provide information to supervisors on what its default experience has been internationally. The ten-year average of an eligible ECAI’s particular assessment would not be expected to match exactly the long-run reference CDR. The long run CDRs are meant as guidance for supervisors, and not as “targets” that ECAs would have to meet. The recommended long-run “reference” three-year CDRs for each of the Committee’s credit risk categories are presented in Table 2 below, based on the Committee’s observations of the default experience reported by major rating agencies internationally.

⁹⁴ It should be noted that each major rating agency would be subject to these comparisons as well, in which its individual experience would be compared to the aggregate international experience.

Table 2: Proposed long run "reference" three-year CDRs

S&P Assessment (Moody's)	AAA-AA (Aaa-Aa)	A (A)	BBB (Baa)	BB (Ba)	B (B)
20-year average of three-year CDR	0.10%	0.25%	1.00%	7.50%	20.00%

2. Comparing an ECAI's most recent three-year CDR to CDR Benchmarks

9. Since an ECAI's own CDRs are not intended to match the reference CDRs exactly, it is important to provide a better sense of what upper bounds of CDRs are acceptable for each assessment, and hence each risk weight, contained in the standardised approach.

10. It is the Committee's general sense that the upper bounds for CDRs should serve as guidance for supervisors and not necessarily as mandatory requirements. Exceeding the upper bound for a CDR would therefore not necessarily require the supervisor to increase the risk weight associated with a particular assessment in all cases if the supervisor is convinced that the higher CDR results from some temporary cause other than weaker credit risk assessment standards.

11. To assist supervisors in interpreting whether a CDR falls within an acceptable range for a risk rating to qualify for a particular risk weight, two benchmarks would be set for each assessment, namely a "monitoring" level benchmark and a "trigger" level benchmark.

(a) "Monitoring" level benchmark

12. Exceeding the "monitoring" level CDR benchmark implies that a rating agency's current default experience for a particular credit risk-assessment grade is markedly higher than international default experience. Although such assessments would generally still be considered eligible for the associated risk weights, supervisors would be expected to consult with the relevant rating agency to understand why the default experience appears to be significantly worse. If supervisors determine that the higher default experience is attributable to weaker standards in assessing credit risk, they would be expected to assign a higher risk category to the agency's credit risk assessment.

(b) "Trigger" level

13. Exceeding the "trigger" level benchmark implies that a rating agency's default experience is considerably above the international historical default experience for a particular assessment grade. Thus there is a presumption that the ECAI's standards for assessing credit risk are either too weak or are not applied appropriately. If the observed three-year CDR exceeds the trigger level in two consecutive years, supervisors would be expected to move the risk assessment into a less favourable risk category. However, if supervisors determine that the higher observed CDR is not attributable to weaker assessment standards, then they may exercise judgement and retain the original risk weight.⁹⁵

⁹⁵ For example, if supervisors determine that the higher default experience is a temporary phenomenon, perhaps because it reflects a temporary or exogenous shock such as a natural disaster, then the risk weighting proposed in the standardised

14. In all cases where the supervisor decides to leave the risk category unchanged, it may wish to rely on “Pillar 2” of the New Accord and encourage banks to hold more capital temporarily or to establish higher reserves.

15. When the supervisor has increased the associated risk category, there would be the opportunity for the assessment to again map to the original risk category if the ECAI is able to demonstrate that its three-year CDR falls and remains below the monitoring level for two consecutive years.

(c) Calibrating the benchmark CDRs

16. After reviewing a variety of methodologies, the Committee decided to use Monte Carlo simulations to calibrate both the monitoring and trigger levels for each credit risk assessment category. In particular, the proposed monitoring levels were derived from the 99.0th percentile confidence interval and the trigger level benchmark from the 99.9th percentile confidence interval. The simulations relied on publicly available historical default data from major international rating agencies. The levels derived for each risk assessment category are presented in Table 3 below, rounded to the first decimal:

Table 3: Proposed three-year CDR benchmarks

S&P Assessment (Moody’s)	AAA-AA (Aaa-Aa)	A (A)	BBB (Baa)	BB (Ba)	B (B)
Monitoring Level	0.8%	1.0%	2.4%	11.0%	28.6%
Trigger Level	1.2%	1.3%	3.0%	12.4%	35.0%

approach could still apply. Likewise, a breach of the trigger level by several ECAIs simultaneously may indicate a temporary market change or exogenous shock as opposed to a loosening of credit standards. In either scenario, supervisors would be expected to monitor the ECAI’s assessments to ensure that the higher default experience is not the result of a loosening of credit risk assessment standards.

Annex 3

Illustrative IRB risk weights

1. The following table provides illustrative risk weights calculated for four asset classes types under the internal ratings-based (IRB) approach to credit risk. Each set of risk weights was produced using one of the risk weight functions set out in Section III of the QIS 3 Technical Guidance. The inputs used to calculate the illustrative risk weights include measures of the probability of default (PD); loss given default (LGD); exposure at default (EAD, set at zero in the examples provided below) and an assumed effective maturity (M) of 2.5 years.
2. A firm size adjustment applies to loans 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 €50 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 loan is assumed to be €5 million.

Illustrative IRB Risk Weights

Asset Class:	Corporate		Residential Mortgage		Other Retail		Qualifying Revolving	
LGD: Maturity: 2.5 years PD:	45%	45%	45%	25%	45%	85%	45%	85%
	Turnover (millions of €):							
	50	5						
0.03%	14.75%	11.61%	4.31%	2.40%	4.97%	9.38%	4.10%	7.74%
0.05%	20.03%	15.80%	6.51%	3.62%	7.42%	14.02%	6.10%	11.52%
0.10%	30.19%	23.91%	11.25%	6.25%	12.54%	23.68%	10.21%	19.29%
0.25%	50.63%	40.34%	22.70%	12.61%	23.91%	45.16%	19.02%	35.93%
0.40%	64.59%	51.60%	32.19%	17.89%	32.28%	60.98%	25.13%	47.46%
0.50%	72.00%	57.57%	37.89%	21.05%	36.86%	69.63%	28.30%	53.45%
0.75%	86.50%	69.21%	50.68%	28.16%	46.01%	86.90%	34.18%	64.56%
1.00%	97.44%	77.91%	62.03%	34.46%	52.90%	99.93%	38.12%	72.01%
1.30%	107.79%	86.05%	74.31%	41.28%	59.25%	111.91%	41.26%	77.94%
1.50%	113.59%	90.58%	81.88%	45.49%	62.64%	118.33%	42.71%	80.68%
2.00%	125.77%	99.99%	99.19%	55.10%	69.20%	130.71%	44.95%	84.90%
2.50%	136.00%	107.85%	114.70%	63.72%	73.96%	139.71%	46.05%	86.98%
3.00%	145.21%	114.97%	128.86%	71.59%	77.67%	146.71%	46.62%	88.07%
4.00%	162.19%	128.33%	154.13%	85.63%	83.50%	157.72%	47.38%	89.50%
5.00%	178.27%	141.41%	176.35%	97.97%	88.56%	167.29%	48.46%	91.53%
6.00%	193.80%	154.44%	196.27%	109.04%	93.64%	176.87%	50.16%	94.74%
10.00%	250.22%	204.50%	260.66%	144.81%	117.95%	222.79%	61.51%	116.19%
15.00%	307.24%	258.48%	320.10%	177.83%	154.81%	292.41%	77.45%	146.29%
20.00%	352.49%	303.50%	365.62%	203.12%	192.33%	363.29%	90.79%	171.49%

Annex 4

Supervisory Slotting Criteria for Specialised Lending

Table 1 - Supervisory Rating Grades for Project Finance Exposures

	Strong	Good	Satisfactory	Weak
Financial strength				
Market conditions	Few competing suppliers OR substantial and durable advantage in location, cost, or technology. Demand is strong and growing.	Few competing suppliers OR better than average location, cost, or technology but this situation may not last. Demand is strong and stable.	Project has no advantage in location, cost, or technology. Demand is adequate and stable.	Project has worse than average location, cost, or technology. Demand is weak and declining.
Financial ratios (e.g. <i>debt service coverage ratio (DSCR)</i> , <i>loan life coverage ratio (LLCR)</i> , <i>project life coverage ratio (PLCR)</i> , and <i>debt-to-equity ratio</i> .)	Strong financial ratios considering the level of project risk; very robust economic assumptions.	Strong to acceptable financial ratios considering the level of project risk; robust project economic assumptions.	Standard financial ratios considering the level of project risk.	Aggressive financial ratios considering the level of project risk.
Stress analysis	The project can meet its financial obligations under sustained, severely stressed economic or sectoral conditions.	The project can meet its financial obligations under normal stressed economic or sectoral conditions. The project is only likely to default under severe economic conditions.	The project is vulnerable to stresses that are not uncommon through an economic cycle, and may default in a normal downturn.	The project is likely to default unless conditions improve soon.
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.

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

	Strong	Good	Satisfactory	Weak
Transaction characteristics				
<i>Design and technology risk</i>	Fully proven technology and design	Fully proven technology and design	Proven technology and design – start-up issues are mitigated by a strong completion package	Unproven technology and design / Technology issues exist and/or complex design
<i>Construction risk</i>				
Permitting and siting	All permits have been obtained.	Some permits are still outstanding but their receipt is considered very likely.	Some permits are still outstanding but the permitting process is well defined and they are considered routine.	Key permits still need to be obtained and are not considered routine. Significant conditions may be attached.
Type of construction contract	Fixed-price date-certain turnkey construction EPC (engineering and procurement contract)	Fixed-price date-certain turnkey construction EPC	Fixed-price date-certain turnkey construction contract with one or several contractors	No or partial fixed-price turnkey contract and/or interfacing issues with multiple contractors
Completion guarantees	Substantial liquidated damages supported by financial substance AND/OR strong completion guarantee from sponsors with excellent financial standing	Significant liquidated damages supported by financial substance AND/OR completion guarantee from sponsors with good financial standing	Adequate liquidated damages supported by financial substance AND/OR completion guarantee from sponsors with good financial standing	Inadequate liquidated damages or not supported by financial substance or weak completion guarantees.
Track record and financial strength of contractor in constructing similar projects.	Strong	Good	Satisfactory	Weak

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

	Strong	Good	Satisfactory	Weak
<i>Supply risk</i>				
Price, volume and transportation risk of feed-stocks; supplier's track record and financial strength	Long-term supply contract with supplier of excellent financial standing.	Long-term supply contract with supplier of good financial standing.	Long-term supply contract with supplier of good financial standing – a degree of price risk may remain.	Short-term supply contract or long-term supply contract with financially weak supplier – a degree of price risk definitely remains.
Reserve risks (e.g. natural resource development)	Independently audited, proven and developed reserves well in excess of requirements over lifetime of the project	Independently audited, proven and developed reserves in excess of requirements over lifetime of the project	Proven reserves can supply the project adequately through the maturity of the debt.	Project relies to some extent on potential and undeveloped reserves.
<i>Financial structure</i>				
Duration of the credit compared to the duration of the project	Useful life of the project significantly exceeds tenor of the loan	Useful life of the project exceeds tenor of the loan	Useful life of the project exceeds tenor of the loan	Useful life of the project may not exceed tenor of the loan.
Amortisation schedule	Amortising debt	Amortising debt	Amortising debt repayments with limited bullet payment.	Bullet repayment or amortising debt repayments with high bullet repayment.

	Strong	Good	Satisfactory	Weak
Strength of Sponsor				
Sponsor's track record, financial strength, and country/sector experience	Strong sponsor with excellent track record and high financial standing	Good sponsor with satisfactory track record and good financial standing	Adequate sponsor with adequate track record and good financial standing	Weak sponsor with no or questionable track record and/or financial weaknesses
Sponsor support, as evidenced by equity, ownership clause and incentive to inject additional cash if necessary	Strong. Project is highly strategic for the sponsor (core business – long-term strategy)	Good. Project is strategic for the sponsor (core business – long-term strategy)	Acceptable. Project is considered important for the sponsor (core business)	Limited. Project is not key to sponsor's long-term strategy or core business
<i>Security Package</i>				
Assignment of contracts and accounts	Fully comprehensive	Comprehensive	Acceptable	Weak
Pledge of assets, taking into account quality, value and liquidity of assets	First perfected security interest in all project assets, contracts, permits and accounts necessary to run the project	Perfected security interest in all project assets, contracts, permits and accounts necessary to run the project	Acceptable security interest in all project assets, contracts, permits and accounts necessary to run the project	Little security or collateral for lenders; weak negative pledge clause
Lender's control over cash flow (e.g. cash sweeps, independent escrow accounts)	Strong	Satisfactory	Fair	Weak
Strength of the covenant package (mandatory prepayments, payment deferrals, payment cascade, dividend restrictions...)	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.

Table 2 - Supervisory Rating Grades for Income-Producing Real Estate Exposures and

High-Volatility Commercial Real Estate Exposures

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

	Strong	Good	Satisfactory	Weak
Cash-flow predictability				
(a) For complete and stabilised property.	The property's leases are long-term with creditworthy tenants and their maturity dates are scattered. The property has a track record of tenant retention upon lease expiration. Its vacancy rate is low. Expenses (maintenance, insurance, security, and property taxes) are predictable.	Most of the property's leases are long-term, with tenants that range in creditworthiness. The property experiences a normal level of tenant turnover upon lease expiration. Its vacancy rate is low. Expenses are predictable.	Most of the property's leases are medium rather than long-term with tenants that range in creditworthiness. The property experiences a moderate level of tenant turnover upon lease expiration. Its vacancy rate is moderate. Expenses are relatively predictable but vary in relation to revenue.	The property's leases are of various terms with tenants that range in creditworthiness. The property experiences a very high level of tenant turnover upon lease expiration. Its vacancy rate is high. Significant expenses are incurred preparing space for new tenants.
(b) For complete but not stabilised property	Leasing activity meets or exceeds projections. The project should achieve stabilisation in the near future	Leasing activity meets or exceeds projections. The project should achieve stabilisation in the near future	Most Leasing activity is within projections; however, stabilisation will not occur for some time.	Market rents do not meet expectations. Despite achieving target occupancy rate, cash flow coverage is tight due to disappointing revenue.
(c) For construction phase	The property is entirely pre-leased through the tenor of the loan or pre-sold to an investment grade tenant or buyer, or the bank has a binding commitment for take-out financing from an investment grade lender.	The property is entirely pre-leased or pre-sold to a creditworthy tenant or buyer, or the bank has a binding commitment for permanent financing from a creditworthy lender	Leasing activity is within projections but the building may not be pre-leased and there may not exist a take-out financing. The bank may be the permanent lender	The property is deteriorating due to cost overruns, market deterioration, tenant cancellations or other factors. There may be a dispute with the party providing the permanent financing.
<i>Asset characteristics</i>				
Location	Property is located in highly desirable location that is convenient to services that tenants desire.	Property is located in desirable location that is convenient to services that tenants desire.	The property location lacks a competitive advantage.	The property's location, configuration, design and maintenance have contributed to the property's difficulties.

	Strong	Good	Satisfactory	Weak
Design and condition	Property is favoured due to its design, configuration, and maintenance, and is highly competitive with new properties.	Property is appropriate in terms of its design, configuration and maintenance. The property's design and capabilities are competitive with new properties.	Property is adequate in terms of its configuration, design and maintenance.	Weaknesses exist in the property's configuration, design or maintenance.
Property is under construction	Construction budget is conservative and technical hazards are limited. Contractors are highly qualified.	Construction budget is conservative and technical hazards are limited. Contractors are highly qualified.	Construction budget is adequate and contractors are ordinarily qualified.	Project is over budget or unrealistic given its technical hazards. Contractors may be under qualified.
Strength of Sponsor/Developer				
Financial capacity and willingness to support the property.	The sponsor/developer made a substantial cash contribution to the construction or purchase of the property. The sponsor/developer has substantial resources and limited direct and contingent liabilities. The sponsor/developer's properties are diversified geographically and by property type.	The sponsor/developer made a material cash contribution to the construction or purchase of the property. The sponsor/developer's financial condition allows it to support the property in the event of a cash flow shortfall. The sponsor/developer's properties are located in several geographic regions.	The sponsor/developer's contribution may be in-material or non-cash. The sponsor/developer is average to below average in financial resources.	The sponsor/developer lacks capacity or willingness to support the property.
Reputation and track record with similar properties.	Experienced management and high sponsors' quality. Strong reputation and lengthy and successful record with similar properties.	Appropriate management and sponsors' quality. The sponsor or management has a successful record with similar properties.	Moderate management and sponsors' quality. Management or sponsor track record does not raise serious concerns.	Ineffective management and substandard sponsors' quality. Management and sponsor difficulties have contributed to difficulties in managing properties in the past.

	Strong	Good	Satisfactory	Weak
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.
<i>Security Package</i>				
Nature of Lien	Perfect first lien. ⁹⁶	Perfect first lien. ³	Perfect first lien. ³	Ability of lender to foreclose is constrained.
Assignment of rents (for projects leased to long-term tenants)	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to remit rents directly to the lender, such as a current rent roll and copies of the project's leases.	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender, such as current rent roll and copies of the project's leases.	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender, such as current rent roll and copies of the project's leases.	The lender has not obtained an assignment of the leases or has not maintained the information necessary to readily provide notice to the building's tenants.
Quality of the insurance coverage	Appropriate	Appropriate	Appropriate	Substandard

⁹⁶ Lenders in some markets extensively use loan structures that include junior liens. Junior liens may be indicative of this level of risk if the total LTV inclusive of all senior positions does not exceed a typical first loan LTV.

Table 3 - Supervisory Rating Grades for Object Finance Exposures

	Strong	Good	Satisfactory	Weak
Financial strength				
Market conditions	Demand is strong and growing, strong entry barriers, low sensitivity to changes in technology and economic outlook.	Demand is strong and stable. Some entry barriers, some sensitivity to changes in technology and economic outlook.	Demand is adequate and stable, limited entry barriers, significant sensitivity to changes in technology and economic outlook.	Demand is weak and declining, vulnerable to changes in technology and economic outlook, highly uncertain environment.
Financial ratios (debt service coverage ratio and loan-to-value ratio)	Strong financial ratios considering the type of asset. Very robust economic assumptions	Strong / acceptable financial ratios considering the type of asset. Robust project economic assumptions.	Standard financial ratios for the asset type.	Aggressive financial ratios considering the type of asset.
Stress analysis	Stable long-term revenues, capable of withstanding severely stressed conditions through an economic cycle.	Satisfactory short-term revenues. Loan can withstand some financial adversity. Default is only likely under severe economic conditions.	Uncertain short-term revenues. Cash flows are vulnerable to stresses that are not uncommon through an economic cycle. The loan may default in a normal downturn.	Revenues subject to strong uncertainties; even in normal economic conditions the asset may default, unless conditions improve.
Market liquidity	Market is structured on a worldwide basis; assets are highly liquid.	Market is worldwide or regional; assets are relatively liquid.	Market is regional with limited prospects in the short term, implying lower liquidity.	Local market and/or poor visibility. Low or no liquidity, particularly on niche markets.

	Strong	Good	Satisfactory	Weak
Political and legal environment				
Political risk, including transfer risk	Very low; strong mitigation instruments, if needed.	Low; satisfactory mitigation instruments, if needed.	Moderate; fair mitigation instruments.	High; no or weak mitigation instruments
Legal and regulatory risks	Jurisdiction is favourable to repossession and enforcement of contracts.	Jurisdiction is favourable to repossession and 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.
Transaction characteristics				
Financial structure				
Financing term compared to the economic life of the asset	Full payout profile/minimum balloon. No grace period	Balloon more significant, but still at satisfactory levels.	Important balloon with potentially grace periods	Repayment in fine or high balloon
Operating risk				
Permits / licensing	All permits have been obtained; asset meets current and foreseeable safety regulations	All permits obtained or in the process of being obtained; asset meets current and foreseeable safety regulations	Most permits obtained or in process of being obtained, outstanding ones considered routine, asset meets current safety regulations	Problems in obtaining all required permits, part of the planned configuration and / or planned operations might need to be revised.
Scope and nature of O & M contracts	Strong long-term O&M contract, preferably with contractual performance incentives, and/or O&M reserve accounts (if needed)	Long-term O&M contract, and/or O&M reserve accounts (if needed)	Limited O&M contract or O&M reserve account (if needed)	No O&M contract: risk of high operational cost overruns beyond mitigants.

	Strong	Good	Satisfactory	Weak
Operator's financial strength, Track record in managing the asset type and capability to re-market asset when it comes off-lease	Excellent track record and strong re-marketing capability.	Satisfactory track record and re-marketing capability.	Weak or short track record and uncertain re-marketing capability.	No or unknown track record and inability to re-market the asset.
Asset characteristics				
Configuration, size, design and maintenance (i.e. age, size for a plane) compared to other assets on the same market	Strong advantage in design and maintenance. Configuration is standard such that the object meets a liquid market.	Above average design and maintenance. Standard configuration, maybe with very limited exceptions - such that the object meets a liquid market.	Average design and maintenance. Configuration is somewhat specific, and thus might cause a narrower market for the object	Below average design and maintenance. Asset is near the end of its economic life. Configuration is very specific; the market for the object is very narrow.
Resale value	Current resale value is well above debt value.	Resale value is moderately above debt value.	Resale value is slightly above debt value.	Resale value is below debt value.
Sensitivity of the asset value and liquidity to economic cycles	Asset value and liquidity are relatively insensitive to economic cycles.	Asset value and liquidity are sensitive to economic cycles.	Asset value and liquidity are quite sensitive to economic cycles.	Asset value and liquidity are highly sensitive to economic cycles.
Strength of Sponsor				
Operator's financial strength, Track record in managing the asset type and capability to re-market asset when it comes off-lease	Excellent track record and strong re-marketing capability.	Satisfactory track record and re-marketing capability.	Weak or short track record and uncertain re-marketing capability.	No or unknown track record and inability to re-market the asset.
Sponsors' track record and financial strength	Sponsors with excellent track record and high financial standing	<i>Sponsors with good track record and good financial standing</i>	Sponsors with adequate track record and good financial standing	Sponsors with no or questionable track record and/or financial weaknesses

	Strong	Good	Satisfactory	Weak
Security Package				
Asset control	Legal documentation provides the lender effective control (e.g. a first perfected security interest, or a leasing structure including such security) on the asset, or on the company owning it.	Legal documentation provides the lender effective control (e.g. a perfected security interest, or a leasing structure including such security) on the asset, or on the company owning it.	Legal documentation provides the lender effective control (e.g. a perfected security interest, or a leasing structure including such security) on the asset, or on the company owning it.	The contract provides little security to the lender and leaves room to some risk of losing control on the asset.
Rights and means at the lender's disposal to monitor the location and condition of the asset (place-holder: expand?)	The lender is able to monitor the location and condition of the asset, at any time and place (regular reports, possibility to lead inspections)	The lender is able to monitor the location and condition of the asset, almost at any time and place	The lender is able to monitor the location and condition of the asset, almost at any time and place	The lender is able to monitor the location and condition of the asset are limited.
Insurance against damages	Strong insurance coverage including collateral damages with top quality insurance companies.	Satisfactory insurance coverage (not including collateral damages) with good quality insurance companies.	Fair insurance coverage (not including collateral damages) with acceptable quality insurance companies.	Weak insurance coverage (not including collateral damages) or with weak quality insurance companies.
Financial strength				
Degree of over-collateralisation of trade	Strong	Good	Satisfactory	Weak

	Strong	Good	Satisfactory	Weak
Political and legal environment				
Country risk	No country risk	Limited exposure to country risk (in particular, offshore location of reserves in an emerging country)	Exposure to country risk (in particular, offshore location of reserves in an emerging country)	Strong exposure to country risk (in particular, inland reserves in an emerging country)
Mitigation of country risks	Very strong mitigation: Strong offshore mechanisms Strategic commodity 1 st class buyer	Strong mitigation: Offshore mechanisms Strategic commodity Strong buyer	Acceptable mitigation: Offshore mechanisms Less strategic commodity Acceptable buyer	Only partial mitigation: No offshore mechanisms Non-strategic commodity Weak buyer
<i>Asset characteristics</i>				
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.

	Strong	Good	Satisfactory	Weak
<i>Strength of Sponsor</i>				
Financial strength of trader	Very strong, relative to trading philosophy and risks.	Strong	Adequate	Weak
Track record, including ability to manage the logistic process.	Extensive experience with the type of transaction in question. Strong record of operating success and cost efficiency.	Sufficient experience with the type of transaction in question. Above average record of operating success and cost efficiency.	Limited experience with the type of transaction in question. Average record of operating success and cost efficiency.	Limited or uncertain track record in general. Volatile costs and profits.
Trading controls and hedging policies	Strong standards for counterparty selection, hedging, and monitoring.	Adequate standards for counterparty selection, hedging, and monitoring.	Past deals have experienced no or minor problems.	Trader has experienced significant losses on past deals.
Quality of financial disclosure	Excellent	Good	Satisfactory	Financial disclosure contains some uncertainties or is insufficient.
<i>Security Package</i>				
Asset control	First perfected security interest provides the lender legal control of the assets at any time if needed.	First perfected security interest provides the lender legal control of the assets at any time if needed.	At some point in the process, there is a rupture in the control of the assets by the lender. The rupture is mitigated by knowledge of the trade process or a third party undertaking as the case may be.	Contract leaves room for some risk of losing control over the assets. Recovery could be jeopardized.

	Strong	Good	Satisfactory	Weak
Rights and means at the lender's disposal to monitor the location and condition of the asset (place-holder: expand?)	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's ability to monitor the location and condition of the asset is limited.
Insurance against damages	Strong insurance coverage including collateral damages with top quality insurance companies.	Satisfactory insurance coverage (not including collateral damages) with good quality insurance companies.	Fair insurance coverage (not including collateral damages) with acceptable quality insurance companies.	Weak insurance coverage (not including collateral damages) or with weak quality insurance companies.

Table 4 - Supervisory Rating Grades for Commodities Finance Exposures

	Strong	Good	Satisfactory	Weak
Financial strength				
Degree of over-collateralisation of trade	Strong	Good	Satisfactory	Weak
Political and legal environment				
Country risk	No country risk	Limited exposure to country risk (in particular, offshore location of reserves in an emerging country)	Exposure to country risk (in particular, offshore location of reserves in an emerging country)	Strong exposure to country risk (in particular, inland reserves in an emerging country)
Mitigation of country risks	Very strong mitigation: Strong offshore mechanisms Strategic commodity 1 st class buyer	Strong mitigation: Offshore mechanisms Strategic commodity Strong buyer	Acceptable mitigation: Offshore mechanisms Less strategic commodity Acceptable buyer	Only partial mitigation: No offshore mechanisms Non-strategic commodity Weak buyer
<i>Asset characteristics</i>				
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.

	Strong	Good	Satisfactory	Weak
<i>Strength of Sponsor</i>				
Financial strength of trader	Very strong, relative to trading philosophy and risks.	Strong	Adequate	Weak
Track record, including ability to manage the logistic process.	Extensive experience with the type of transaction in question. Strong record of operating success and cost efficiency.	Sufficient experience with the type of transaction in question. Above average record of operating success and cost efficiency.	Limited experience with the type of transaction in question. Average record of operating success and cost efficiency.	Limited or uncertain track record in general. Volatile costs and profits.
Trading controls and hedging policies	Strong standards for counterparty selection, hedging, and monitoring.	Adequate standards for counterparty selection, hedging, and monitoring.	Past deals have experienced no or minor problems.	Trader has experienced significant losses on past deals.
Quality of financial disclosure	Excellent	Good	Satisfactory	Financial disclosure contains some uncertainties or is insufficient.
<i>Security Package</i>				
Asset control	First perfected security interest provides the lender legal control of the assets at any time if needed.	First perfected security interest provides the lender legal control of the assets at any time if needed.	At some point in the process, there is a rupture in the control of the assets by the lender. The rupture is mitigated by knowledge of the trade process or a third party undertaking as the case may be.	Contract leaves room for some risk of losing control over the assets. Recovery could be jeopardized.

Annex 5

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 advice
	Card Services	Merchant/Commercial/Corporate cards, private labels and retail
Commercial Banking	Commercial Banking	Project finance, real estate, export finance, trade finance, factoring, leasing, lends, guarantees, bills of exchange
Payment and Settlement ⁹⁷	External Clients	Payments and collections, funds transfer, clearing and settlement
Agency Services	Custody	Escrow, Depository Receipts, Securities lending (Customers) Corporate actions
	Corporate Agency	Issuer and paying agents
	Corporate Trust	
Asset Management	Discretionary Fund Management	Pooled, segregated, retail, institutional, closed, open, private equity
	Non-Discretionary Fund Management	Pooled, segregated, retail, institutional, closed, open
Retail Brokerage	Retail Brokerage	Execution and full service

⁹⁷ Payment and settlement losses related to a bank's own activities would be incorporated in the loss experience of the affected business line.

Principles for business line mapping

- (a) All activities must be mapped into the eight level 1 business lines in a mutually exclusive and jointly exhaustive manner;
- (b) Any banking or non-banking activity which cannot be readily mapped into the business line framework, but which represents an ancillary function to an activity included in the framework, must be allocated to the business line it supports. If more than one business line is supported through the ancillary activity, an objective mapping criteria must be used (eg, proportional allocation of the indicators);
- (c) When mapping gross income, if an activity cannot be mapped into a particular business line then the business line yielding the highest charge must be used. The same business line equally applies to any associated ancillary activity;
- (d) The mapping of activities into business lines for operational risk capital purposes must be consistent with the definitions of business lines used for regulatory capital calculations in other risk categories, i.e. credit and market risk. Any deviations from this principle must be clearly motivated and documented;
- (e) The mapping process used must be clearly documented. In particular, written business line definitions must be clear and detailed enough to allow third parties to replicate the business line mapping. Documentation must, among other things, clearly motivate any exceptions or overrides and be kept on record;
- (f) Processes must be in place to define the mapping of any new activities or products;
- (g) Senior management is responsible for the mapping process (which is subject to the approval by the board of directors); and
- (h) The mapping process to business lines must be subject to independent review.

Annex 6

Operational Risk - Detailed loss event type classification

Event-Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples (Level 3)
Internal fraud	Losses due to acts of a type intended to defraud, misappropriate property or circumvent regulations, the law or company policy, excluding diversity/discrimination events, which involves at least one internal party.	Unauthorised Activity	Transactions not reported (intentional) Trans type unauthorised (w/monetary loss) Mismarking of position (intentional)
		Theft and Fraud	Fraud / credit fraud / worthless deposits Theft / extortion / embezzlement / robbery Misappropriation of assets Malicious destruction of assets Forgery Check kiting Smuggling Account take-over / impersonation / etc. Tax non-compliance / evasion (wilful) Bribes / kickbacks Insider trading (not on firm's account)
External fraud	Losses due to acts of a type intended to defraud, misappropriate property or circumvent the law, by a third party	Theft and Fraud	Theft/Robbery Forgery Check kiting
		Systems Security	Hacking damage Theft of information (w/monetary loss)
Employment Practices and Workplace Safety	Losses arising from acts inconsistent with employment, health or safety laws or agreements, from payment of personal injury claims, or from diversity / discrimination events	Employee Relations	Compensation, benefit, termination issues Organised labour activity
		Safe Environment	General liability (slip and fall, etc.) Employee health & safety rules events Workers compensation
		Diversity & Discrimination	All discrimination types
Clients, Products & Business Practices	Losses arising from an unintentional or negligent failure to meet a professional obligation to specific clients (including fiduciary and suitability requirements), or from the nature or design of a product.	Suitability, Disclosure & Fiduciary	Fiduciary breaches / guideline violations Suitability / disclosure issues (KYC, etc.) Retail consumer disclosure violations Breach of privacy Aggressive sales Account churning Misuse of confidential information Lender Liability

Event-Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples (Level 3)
		Improper Business or Market Practices	Antitrust Improper trade / market practices Market manipulation Insider trading (on firm's account) Unlicensed activity Money laundering
		Product Flaws	Product defects (unauthorised, etc.) Model errors
		Selection, Sponsorship & Exposure	Failure to investigate client per guidelines Exceeding client exposure limits
		Advisory Activities	Disputes over performance of advisory activities
Damage to Physical Assets	Losses arising from loss or damage to physical assets from natural disaster or other events.	Disasters and other events	Natural disaster losses Human losses from external sources (terrorism, vandalism)
Business disruption and system failures	Losses arising from disruption of business or system failures	Systems	Hardware Software Telecommunications Utility outage / disruptions
Execution, Delivery & Process Management	Losses from failed transaction processing or process management, from relations with trade counterparties and vendors	Transaction Capture, Execution & Maintenance	Miscommunication Data entry, maintenance or loading error Missed deadline or responsibility Model / system misoperation Accounting error / entity attribution error Other task misperformance Delivery failure Collateral management failure Reference Data Maintenance
		Monitoring and Reporting	Failed mandatory reporting obligation Inaccurate external report (loss incurred)
		Customer Intake and Documentation	Client permissions / disclaimers missing Legal documents missing / incomplete
		Customer / Client Account Management	Unapproved access given to accounts Incorrect client records (loss incurred) Negligent loss or damage of client assets
		Trade Counterparties	Non-client counterparty misperformance Misc. non-client counterparty disputes
		Vendors & Suppliers	Outsourcing Vendor disputes

Annex 7

Overview of Methodologies for the Capital Treatment of Transactions Secured by Financial Collateral under the Standardised and IRB Approaches

1. The rules set forth in The standardised approach – Credit risk mitigation (CRM), paragraphs xyz, for collateralised transactions generally determine the treatment under both the standardised and the foundation internal ratings-based (IRB) approaches for claims in the banking book that are secured by financial collateral of sufficient quality. Banks using the advanced IRB approach will typically take financial collateral on banking book exposures into account by using their own internal estimates to adjust the exposure's loss given default (LGD). One exception for advanced IRB bank pertains to the recognition of repo-style transactions subject to a master netting agreement, as discussed below.

2. Collateralised exposures that take the form of repo-style transactions (i.e. repo/reverse repos and securities lending/borrowing) are subject to special considerations. Such transactions that are held in the trading book are subject to a counterparty risk capital charge as described below. Further, all banks, including those using the advanced IRB approach, must follow the methodology in the CRM section, which is outlined below, for repo-style transactions booked in either the banking book or trading book that are subject to master netting agreements if they wish to recognise the effects of netting for capital purposes.

Standardised and Foundation IRB Approaches

3. Banks under the standardised approach may use either the simple approach or the comprehensive approach for determining the appropriate risk weight for a transaction secured by eligible financial collateral. Under the simple approach, the risk weight of the collateral is substituted for that of the counterparty. Apart from a few types of very low risk transactions, the risk weight floor is 20%. Under the foundation IRB approach, banks may only use the comprehensive approach.

4. Under the comprehensive approach, eligible financial collateral reduces the amount of the exposure to the counterparty. The amount of the collateral is decreased and, where appropriate, the amount of the exposure is increased through the use of haircuts, to account for potential changes in the market prices of securities and foreign exchange rates over the holding period. This results in an adjusted exposure amount, E^* . Banks may either use supervisory haircuts set by the Basel Committee or, subject to qualifying criteria, rely on their "own" estimates of haircuts. Where the supervisory holding period for calculating the haircut amounts differs from the holding period set down in the rules for that type of collateralised transaction, the haircuts are to be scaled up or down as appropriate. Once E^* is calculated, the standardised bank will assign that amount a risk weight appropriate to the counterparty. For transactions secured by financial collateral other than repos subject to a master netting agreement, foundation IRB banks are to use E^* to adjust the loss given default (LGD) on the exposure.

Special Considerations for Repo-Style Transactions

5. Repo-style transactions booked in the trading book, will, like OTC derivatives held in the trading book, be subject to a counterparty credit risk charge. In calculating this charge, a bank under the standardised approach must use the comprehensive approach to collateral; the simple approach will not be available.

6. The capital treatment for repo-style transactions that are not subject to master netting agreements is the same as that for other collateralised transactions. However, for banks using the comprehensive approach, national supervisors have the discretion to determine that a haircut of zero may be used where the transaction is with a core market participant and meets certain other criteria (so-called carve-out treatment). Where repo-style transactions are subject to a master netting agreement whether they are held in the banking book or trading book, a bank may choose not to recognise the netting effects in calculating capital. In that case, each transaction will be subject to a capital charge as if there were no master netting agreement.

7. If a bank wishes to recognise the effects of master netting agreements on repo-style transactions for capital purposes, it must apply the treatment the CRM section sets forth in that regard on a counterparty-by-counterparty basis. This treatment would apply to all repo-style transactions subject to master netting agreements, regardless of whether the bank is under the standardized, foundation IRB, or advanced IRB approach and regardless of whether the transactions are held in the banking or trading book. Under this treatment, the bank would calculate E^* as the sum of the net current exposure on the contract plus an add-on for potential changes in security prices and foreign exchange rates. The add-on may be determined through the supervisory haircuts or, for those banks that meet the qualifying criteria, own estimate haircuts or an internal VAR model. The carve-out treatment for haircuts on repo-style transactions may not be used where an internal VAR model is applied.

8. The calculated E^* is in effect an unsecured loan equivalent amount that would be used for the exposure amount under the standardized approach and the exposure at default (EAD) value under both the foundation and advanced IRB approaches. E^* thus would be treated in the same manner as the credit equivalent amount (calculated as the sum of replacement cost plus an add-on for potential future exposure) for OTC derivatives subject to master netting agreements, which is used for EAD under the IRB approaches.