SECTION II.1 - CREDIT RISK: *INTERNAL RATINGS BASED APPROACH*
General Principles

1.0 Prior to utilising this approach to calculate their risk-weighted exposure amounts, credit institutions need express approval from the authority.

2.0 Permission shall be given only if the authority is satisfied that the credit institution's systems for the management and rating of credit risk exposures are sound and implemented with integrity and, in particular, that they meet the following standards in accordance with Section II.5 of this Appendix:

(a) the credit institution's rating systems provide for a meaningful assessment of obligor and transaction characteristics, a meaningful differentiation of risk and accurate and consistent quantitative estimates of risk;

(b) internal ratings and default and loss estimates used in the calculation of capital requirements and associated systems and processes play an essential role in the risk management and decision-making process, and in the credit approval, internal capital allocation and corporate governance functions of the credit institution;

(c) the credit institution has a credit risk control unit responsible for its rating systems that is appropriately independent and free from undue influence;

(d) the credit institution collects and stores all relevant data to provide effective support to its credit risk measurement and management process;

(e) the credit institution documents its rating systems, the rationale for their design and validates its rating systems.

3.0 Where an EU parent credit institution and its subsidiaries or an EU parent financial holding company and its subsidiaries or an EU parent mixed financial holding company and its subsidiaries use the IRB Approach on a unified basis, the authority may allow the minimum requirements above to be met by the parent and its subsidiaries considered together.

4.0 A credit institution applying for the use of the IRB Approach shall demonstrate that it has been using the IRB exposure classes and relative rating systems for internal risk measurement and management purposes for at least three years prior to its qualification to the use the IRB Approach.

5.0 Similarly, a credit institution applying for the use of own estimates of LGDs and/or conversion factors (i.e. applying to utilise the Advanced IRB Approach) needs to demonstrate that it has been estimating and employing such calculations for at least three years prior to qualification to use own estimates of LGDs and/or conversion factors.

6.0 If a credit institution ceases to comply with the requirements set out in this Section, it shall either present to the authority a plan for a timely return to compliance or demonstrate that the effect of non-compliance is immaterial.

7.0 When the IRB Approach is intended to be used by the EU parent credit institution and its subsidiaries, or by the EU parent financial holding company and its subsidiaries, or the EU parent mixed financial holding company and its subsidiaries, the respective Authorities shall co-operate closely.

8.0 In the case of applications for the permissions to utilise the IRB Approach submitted by an EU parent credit institution and its subsidiaries, or jointly by the subsidiaries on an EU parent financial holding company or an EU parent mixed financial holding company, the authorities shall work together, in full consultation, to decide whether or not to grant the permission sought and to determine the terms and conditions, if any, to which such permission should be subject. Such an application shall need to be submitted only to the EU consolidating authority.

9.0 The authorities shall do everything within their power to reach a joint decision on the application within six months from the receipt of the compete application by the consolidating authority. This joint decision shall be set out in a document containing the fully reasoned decision which shall be provided to the applicant by the consolidating authority.

10.0 In the absence of a joint decision between the authorities within six months, the consolidating authority shall make its own decision on the application. The decision shall be set out in a document containing the fully reasoned decision and shall take into account the views and reservations of the other authorities expressed during the six months period. The decision shall be provided to the applicant and the other relevant authorities by the consolidating authority. If, at the end of the six month period, any of the authorities concerned has referred the matter to EBA in accordance with Article 19 of Regulation (EU) No 1093/2010, the consolidating authority shall defer its decision and await any decision that EBA may take in accordance with Article 19(3) of that Regulation on its decision, and shall take its decision in conformity with the decision of EBA. The six-month period shall be deemed the conciliation period within the meaning of that Regulation. EBA shall take its decision within 1 month. The matter shall not be referred to EBA after the end of the six month period or after a joint decision has been reached.

11.0 The decisions referred to in paragraphs 9.0 and 10.0 above shall be recognised as determinative and applied by the authorities in the EU member states concerned.

12.0 In the case of local credit institutions controlled by an EU parent credit institution, the authority shall, whenever possible, contact the consolidating authority when in need of information regarding the implementation of approaches and methodologies set out in this Rule that may already be available to that authority.

Sequential implementation

13.0 Without prejudice to paragraph 44.0, credit institutions and any parent undertaking and its subsidiaries shall implement the IRB Approach for all exposures. However, subject to approval of the authority, implementation may be carried out sequentially across the different exposure classes within the same business unit, across different business units in the same group, or for the use of own estimates of LGDs or conversion factors for the calculation of risk weights for exposures to corporates, institutions and central governments and central banks. In the case of the retail exposure class, implementation may be carried out sequentially across the categories of exposures to which the different correlations in Section II.2 paragraphs 1.3.1 to 1.3.4 correspond.

14.0 Implementation as referred to in paragraph 13.0 shall be carried out within a reasonable period of time to be agreed with and subject to strict conditions determined by the authority. The latter conditions shall be designed to ensure that the flexibility allowed under paragraph 13.0 is not used selectively with the purpose of achieving reduced minimum capital requirements in respect of those exposure classes or business units that are yet to be included in the IRB Approach or in the use of own estimates of LGDs and conversion factors.

15.0 Credit institutions using the IRB Approach for any exposure class shall at the same time use the IRB Approach for the equity exposure class.

16.0 Credit institutions which have obtained permission to use the IRB Approach shall not revert to the use of the Standardised Approach for the calculation of risk-weighted exposure amounts, except for demonstrated good cause and subject to the approval of the authority.

17.0 Similarly, credit institutions which have obtained permission to use own estimates of LGDs and Conversion factors (i.e. under the Advanced IRB Approach), shall not revert to the use of LGD values and conversion factors provided in this directive (i.e. to the Foundation IRB Approach) except for demonstrated good cause and subject to the approval of the authority.

Exposure Classes

18.0 Each exposure shall be assigned to one of the following exposure classes:

(a) claims or contingent claims on central governments and central banks;

(b) claims or contingent claims on institutions;

(c) claims or contingent claims on corporates;

(d) retail claims or contingent retail claims;

(e) equity claims;

(f) securitisation positions;

(g) other non-credit-obligation assets.

19.0 The following exposures shall be treated as exposures to central governments and central banks:

(a) exposures to regional governments, local authorities or public sector entities which are treated as exposures to central governments under the Standardised Approach;

(b) exposures to Multilateral Development Banks and International Organisations which attract a risk weight of 0% under the Standardised Approach.

20.0 The following exposures shall be treated as exposures to institutions:

(a) exposures to regional governments and local authorities which are not treated as exposures to central governments under the Standardised Approach;

(b) exposures to Public Sector Entities which are treated as exposures to institutions under the Standardised Approach;

(c) exposures to Multilateral Development Banks which do not attract a 0% risk weight under the Standardised Approach.

21.0 To be eligible for the retail exposure class, exposures shall meet the following conditions:

(a) they shall be either to an individual person or persons, or to a small or medium sized entity (SME). The present value of retail minimum lease payments is also eligible.

(b) In the case of SMEs, the total amount owed to the credit institution and parent undertakings and its subsidiaries, including any past due exposure, by the obligor client or group of connected clients, but excluding claims or contingent claims secured on residential real estate collateral, must not, to the knowledge of the credit institution, which must have taken reasonable steps to confirm the situation, exceed €1 million.

(c) They are treated by the credit institution in its risk management consistently over time and in a similar manner;

(d) They are not managed just as individually as exposures in the corporate exposure class.

(e) They represent one of a significant number of similarly managed exposures

The present value of retail minimum lease payments is eligible for the retail exposure class.

22.0 The following shall be classed as equity exposures:

(a) non-debt exposures conveying a subordinated, residual claim on the assets or income of the issuer;

(b) debt exposures of which the economic substance is similar to the exposures specified in (a).

23.0 Within the corporate exposure class, credit institutions shall separately identify specialised lending exposures, which have the following characteristics:

(a) the exposure is to an entity which was created specifically to finance and/or operate physical assets;

(b) the contractual arrangements give the lender a substantial degree of control over the assets and the income that they generate;

(c) the primary source of repayment of the obligation is the income generated by the assets being financed, rather than the independent capacity of a broader commercial enterprise.

24.0 Any credit obligation not assigned to the above defined exposure classes, shall be assigned to the Corporate exposure class.

25.0 The Other non-credit-obligation assets exposure class shall include the residual value of leased properties, if these are not included in the lease exposure as defined in paragraph 1.4 of Appendix 2 Section II.4.

26.0 The methodology used by the credit institution for assigning exposures to different exposure classes shall be appropriate and consistent over time.

Calculation of Risk Weighted Assets

27.0 With the exception of securitisation exposures, the risk weighted exposure amounts for credit risk shall, unless deducted from own funds, be calculated in accordance with Appendix 2, Section II.2. On the other hand, the risk weighted exposure amounts for securitisation exposures shall be calculated in accordance with Appendix 3.

28.0 The risk-weighted exposure amounts for dilution risk for purchased receivables shall be calculated according to Appendix 2, Section II.2, paragraph 2.1.0. However, where a credit institution has full recourse in respect of purchased receivables for default risk and dilution risk, the exposure may be treated as a collateralised exposure.

29.0 The calculation of risk-weighted exposure amounts for credit risk and dilution risk shall be based on the relevant parameters associated with the exposure in question. These shall include probability of default (PD), loss given default (LGD), maturity (M) and the exposure value of the exposure (EAD). PD and LGD may be considered separately or jointly, in accordance with the provisions of Appendix 2, Section II.3.

30.0 Notwithstanding paragraph 29.0, the calculation of risk-weighted exposure amounts for credit risk for all exposures belonging to the equity exposure class shall be calculated in accordance with Section II.2 paragraphs 1.4.1 to 1.4.10 subject to the approval of the authority. The authority will only allow a credit institution to use the approach set out in Section II.2 paragraphs 1.4.9 to 1.4.10, if it meets the minimum requirements listed in Section II.5 paragraphs 4.1.1 to 4.3.7.

31.0 Notwithstanding paragraph 29.0, the calculation of risk weighted exposure amounts for credit risk for specialised lending exposures may be calculated in accordance with Section II.2 paragraphs 1.2.4. The authority shall publish guidance on how credit institutions should assign risk weights to specialised lending exposures under Section II.2 paragraphs 1.2.4 and shall approve institutions assignment methodologies.

32.0 For exposures belonging to the following exposure classes,

- central governments and central banks;
- institutions;
- corporates; and,
- retail,

credit institutions shall provide their own estimates of PDs in accordance with paragraphs 1.0 to 7.0 in Appendix 2 Section II.1 and Appendix 2 Section II.5.

33.0 For exposures under the retail exposure class, credit institutions shall provide own estimates of LGDs and conversion factors in accordance with paragraphs 1.0 to 7.0 in Appendix 2 Section II.1 and Appendix 2 Section II.5. Therefore, only the Advanced IRB Approach may be utilised to calculate the credit risk weighted assets under the retail exposure class.

34.0 For exposures belonging to the following exposure classes:

- central governments and central banks;
- institutions; and,
- corporates,

credit institutions shall either apply the LGD values set out in Appendix 2 Section II.3 paragraph 1.2.1 and the conversion factors set out in Section II.4 paragraph 1.9(a) to (d) (i.e. utilise the Foundation IRB Approach), or else, subject to the approval of the authority, credit institutions may use own estimates of LGDs and conversion factors in accordance with Appendix 2 Section II.1 paragraphs 1.0 to 7.0 and Section II.5 (i.e. utilise the Advanced IRB Approach).

35.0 The risk-weighted exposure amounts for securitised exposures and exposures falling under the Securitisation exposure class shall be calculated as set out in Appendix 3

36.0 Where exposures in the form of collective investment undertakings (CIU) meet the criteria under the Standardised Approach Appendix 2 Section I.2 paragraphs 15.4-15.4, and the credit institution is aware of all the underlying exposures of the CIU, the credit institution shall look through to those underlying exposures in order to calculate risk-weighted exposure amounts and expected loss amounts in accordance with the IRB methods stipulated in this Section. Paragraph 37 shall apply to the part of the underlying exposures of the CIU, the credit institution is not aware of or could not reasonably be aware of. In particular, para 37 shall apply where it would be unduly burdensome for the credit institution to look through the underlying exposures in order to calculate risk-weighted exposure amounts and expected loss amounts in accordance with the IRB methods stipulated in this

However, where the credit institution does not meet the conditions for using the methods set out in this Section for all or parts of the underlying exposures of the CIU, risk weighted exposure amounts and expected loss amounts shall be calculated in accordance with the following approaches:

(a) for exposures belonging to the equity exposure class, the approach set out in paragraphs 1.4.3 to 1.4.5 in Section II.2.

(b) For all other underlying exposures, the Standardised Approach shall be utilised, but subject to the following modifications:

i. for exposures subject to a specific risk weight for unrated exposures or subject to the credit quality step yielding the highest risk weight for a given exposure class, the risk weight must be multiplied by a factor of two but must not be higher than 1250%;

ii. for all other exposures, the risk weight must be multiplied by a factor of 1.1 and must be subject to a minimum of 5%.

Where, for the purposes of (a) above, the credit institution is unable to differentiate between private equity, exchange-traded and other equity exposures, it shall treat the exposures concerned as other equity exposures. Without prejudice to the transitional provisions found in Para 12 of Annex V, where those exposures, taken together with the credit institution’s direct exposures in that exposure class , are not material within the meaning of para 44.0, para 45.0 below may be applied subject to the approval of the authority.

37.0 Where exposures in the form of a CIU do not meet the criteria set out in the Standardised Approach Appendix 2 Section I.2 paragraphs 15.4-15.4, or the credit institution is not aware of all of the underlying exposures of the CIU, the credit institution shall look through to the underlying exposures and calculate risk-weighted exposure amounts and expected loss amounts in accordance with the approach set out in Section II.2 paragraphs 1.4.3 to 1.4.5. If. For those purposes, the credit institution is unable to differentiate between private equity exchange-traded and other equity exposures, it shall treat the exposures concerned as other equity exposures. For these purposes, non equity exposures are assigned to one of the classes (private equity, exchange traded equity or other equity) set out in Section II.2 paragraph 1.4.3 and unknown exposures are assigned to other equity classes.

Alternatively to the method described above, credit institutions may calculate themselves or may rely on a third party to calculate and report the average risk weighted exposure amounts based on the CIU's underlying exposures in accordance with the approaches set out in (a) and (b) of para 36.0 above, provided that the correctness of the calculation and the report is adequately ensured.

Expected loss amounts

38.0 The expected loss amounts for exposures belonging to one of the following exposure classes:

- central governments and central banks;
- institutions;
- corporates;
- retail, and,
- equity,

shall be calculated in accordance with the methods set out in paragraphs 3.1.0 to 3.7.0 of Section II.2 of Appendix 2.

39.0 The calculation of expected loss amounts in accordance with paragraphs 3.1.0 to 3.7.0 in Section II.2 of Appendix 2 shall be based on the same input figures of PD, LGD and the exposure value for each exposure as being used for the calculation of risk-weighted exposure amounts in accordance with paragraphs 27 to 37 above. For defaulted exposures, where credit institutions use own estimates of LGDs, EL shall be ELBE (i.e. expected loss best estimate), the credit institution's best estimate of expected loss for the defaulted exposure according to paragraph 2.2.41 of Section II.5.

40.0 The expected loss amounts for securitised exposures shall be calculated in accordance with Appendix 3.

41.0 The expected loss amounts for exposures belonging to the 'other non-credit-obligation assets' exposure class shall be zero.

42.0 The expected loss amounts for dilution risk of purchased receivables shall be calculated in accordance with the methods set out in paragraph 3.7.0 of Section II.2 of Appendix 2.

43.0 The expected loss amounts for exposures referred to in paragraphs 36.0 and 37.0 above shall be calculated in accordance with the methods set out in paragraphs 3.1.0 to 3.7.0 of Section II.2 of Appendix 2.

Partial Use

44.0 Subject to the approval of the authority, credit institutions permitted to use the IRB Approach in the calculation of risk-weighted exposure amounts and expected loss amounts for one or more exposure classes may apply the Standardised Approach for the following:

(a) the exposures under the Central Government and Central Bank exposure class, where the number of material counterparties is limited and it would be unduly burdensome for the credit institutions to implement a rating system for these counterparties,

(b) the Institutions exposure class, where the number of material counterparties is limited and it would be unduly burdensome for the credit institution to implement a rating system for these counterparties,

(c) exposures in non-significant business units as well as exposure classes that are immaterial in terms of size and perceived risk profile,

(d) exposures to Central Governments of Member States and their regional governments, local authorities and administrative bodies, provided that:

a. there is no difference in risk between the exposures to that central government and those other exposures because of specific public arrangements, and

b. exposures to the central government are associated with a 0% risk weight under the Standardised Approach,

(e) exposures of a credit institution to a counterparty which is its parent undertaking, its subsidiary or a subsidiary of its parent undertaking provided that the counterparty is an institution or a financial holding company, mixed financial holding company, financial institution, asset management company or ancillary services undertaking subject to appropriate prudential requirements or an undertaking linked by a relationship within the meaning of Article 12(1) of Directive 83/349/EEC and exposures between credit institutions which meet the following requirements:

a. the counterparty is an institution or a financial holding company, mixed financial holding company, financial institution, asset management company or ancillary services undertaking subject to appropriate prudential requirements;
b. the counterparty is established in the same Member State as the credit institution;
c. there is no current or foreseen material or legal impediment to the prompt transfer of own funds or repayment of liabilities from the counterparty to the credit institution;
d. the credit institution and the counterparty have entered into a contractual or statutory liability arrangement which protects those institutions and in particular ensures their liquidity and solvency to avoid bankruptcy in case it becomes necessary; and,
e. the arrangements ensure that the institutional protection scheme will be able to grant support necessary under its commitment from funds readily available to it.

(f) equity exposures to entities whose credit obligations qualify for a zero risk weight under the Standardised Approach (including those publicly sponsored entities where a zero risk weight can be applied),

(g) equity exposures incurred under legislated programmes to promote specified sectors of the economy that provide significant subsidies for the investment to the credit institution and involve some form of government oversight and restrictions on the equity investments. This exclusion is limited to an aggregate of 10% of original own funds plus additional own funds,

(h) exposures specified in paragraph 6.11 of Section I.2 meeting the conditions specified therein, and

(i) State and State-reinsurance guarantees pursuant to paragraph 2.3.2 of Section III.3.

This paragraph shall not prevent the authorities of other member states to allow the application of the Standardised Approach for equity exposures which have been allowed for this treatment in other member states.

45.0 For the purposes of paragraph 44.0, the equity exposure class of a credit institution shall be considered material if their aggregate value excluding equity exposures incurred under legislative programmes as referred to in point (g) above, exceeds, on average over the preceding year, 10% of the credit institution's own funds. If the number of those equity exposures is less than 10 individual holdings, that threshold shall be 5% of the credit institution's own funds.

Disclosure by credit institutions

46.0 Credit institutions should, if requested, explain their rating decisions to SMEs, and other corporate applicants for loans, providing an explanation in writing when asked. Any administrative costs of the explanation have to be at an appropriate rate to the size of the loan.

SECTION II.2 - CREDIT RISK: *INTERNAL RATINGS BASED APPROACH* *Risk weighted exposure amounts and expected loss amounts*

1.1.0 CALCULATION OF RISK WEIGHTED EXPOSURE AMOUNTS FOR CREDIT RISK

1.1.1 Unless noted otherwise, the input parameters probability of default (PD), loss given default (LGD), and maturity value (M) shall be determined as set out in Section II.3, the exposure value shall be determined as set out in Section II.4.

1.1.2 The risk weighted exposure amount for each exposure shall be calculated in accordance with the following formulas:

1.2.0 Risk weighted exposure amounts for exposures to corporates, institutions and central governments and central banks.

1.2.1 Subject to paragraphs 1.2.3 to 1.2.7 the risk weighted exposure amounts for exposures to corporates, institutions and central governments and central banks shall be calculated according to the following formulas:

Correlation (R) =

$$0.12 \times (1 - EXP(-50 * PD))/(1 - EXP(-50)) + 0.24 * [1 - (1 - EXP(-50 * PD))/(1 - EXP(-50))]$$

Maturity factor (b) = $(0.11852 - 0.05478 * \ln(PD))^2$

Risk weight (RW) =
$(LGD * N[(1 - R)^{-0.5} * G(PD) + (R/(1 - R))^{0.5} * G(0.999)] - PD * LGD) * (1 - 1.5 * b)^{-1} * (1 + (M - 2.5) * b) * 12.5 * 1.06$

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

Risk-weighted exposure amount = RW * exposure value

For PD = 0: RW shall be: 0

For PD = 1:

for defaulted exposures where credit institutions apply the LGD values set out in paragraph 1.2.1 of Section II.3 of this Appendix , RW shall be: 0;

for defaulted exposures where credit institutions use own estimates of LGDs, RW shall be: Max{0, 12.5 *(LGD-EL_{BE})};

where EL_{BE} shall be the credit institution's best estimate of expected loss for the defaulted exposure according to paragraph 2.2.41 of Section II.5 of this Appendix.

1.2.2 The risk weighted exposure amount for each exposure which meets the requirements set out in paragraph 2.2.1 of Section III.2 and paragraph 2.5.1 of Section III.3 may be adjusted according to the following formula:

Risk-weighted exposure amount = RW * exposure value * (0.15 + 160*PDpp)]

PDpp = PD of the protection provider

RW shall be calculated using the relevant risk weight formula set out in paragraph 1.2.1 for the exposure, the PD of the obligor and the LGD of a comparable direct exposure to the protection provider. The maturity factor (b) shall be calculated using the lower of the PD of the protection provider and the PD of the obligor.

1.2.3 For exposures to companies where the total annual sales for the consolidated group of which the firm is a part is less than EUR 50 million credit institutions may use the following correlation formula for the calculation of risk weights for corporate exposures. In this formula S is expressed as total annual sales in millions of Euros with EUR 5 million <= S <= EUR 50 million. Reported sales of less than EUR 5 million shall be treated as if they were equivalent to EUR 5 million. For purchased receivables the total annual sales shall be the weighted average by individual exposures of the pool.

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

Credit institutions shall substitute total assets of the consolidated group for total annual sales when total annual sales are not a meaningful indicator of firm size and total assets are a more meaningful indicator than total annual sales.

1.2.4 For specialised lending exposures that a credit institution cannot demonstrate that its PD estimates meet the minimum requirements set out in Section II.5 it shall assign risk weights to these exposures according to table 1.

Table 1:

Remaining Maturity	**category 1**	**category 2**	**category 3**	**category 4**	**category 5**
Less than 2.5 years	50%	70%	115%	250%	0%
Equal or more than 2.5 years	70%	90%	115%	250%	0%

Subject to the authority’s approval, a credit institution may assign preferential risk weights of 50% to exposures in category 1, and a 70% risk weight to exposures in category 2, provided the credit institutions’ underwriting characteristics and other risk characteristics are substantially strong for the relevant category.

In assigning risk weights to specialised lending exposures credit institutions shall take into account the following factors: Financial strength, political and legal environment, transaction and/or asset characteristics, strength of the sponsor and developer including any public private partnership income stream, security package.

1.2.5 For their purchased corporate receivables credit institutions shall comply with the minimum requirements set out in paragraphs 2.2.64 to 2.2.68 to Section II.5. For purchased corporate receivables that comply in addition with the conditions set out in paragraph 1.3.5, and where it would be unduly burdensome for a credit institution to use the risk quantification standards for corporate exposures as set out in Section II.5 for these receivables, the risk quantification standards for retail exposures as set out in Section II.5 may be used.

1.2.6 For purchased corporate receivables, refundable purchase discounts, collateral or partial guarantees that provide first-loss protection for default losses, dilution losses, or both, may be treated as first-loss positions under the IRB securitisation framework.

1.2.7 Where an institution provides credit protection for a number of exposures under terms that the *n*th default among the exposures shall trigger payment and that this credit event shall terminate the contract, if the product has an external credit assessment from an eligible ECAI the risk weights set out in Section I.1 of Appendix 3 will be applied. If the product is not rated by an eligible ECAI, the risk weights of the exposures included in the basket will be aggregated, excluding *n*-1 exposures where the sum of the expected loss amount multiplied by 12.5 and the risk weighted exposure amount shall not exceed the nominal amount of the protection provided by the credit derivative multiplied by 12.5. The *n-1* exposures to be excluded from the aggregation shall be determined on the basis that they shall include those exposures each of which produces a lower risk-weighted exposure amount than the risk-weighted exposure amount of any of the exposures included in the aggregation.

1.3.0 Risk weighted exposure amounts for retail exposures:

1.3.1 Subject to paragraphs 1.3.3 and 1.3.4 the risk weighted exposure amounts for retail exposures shall be calculated according to the following formulas:

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

Risk weight (RW):
$(LGD * N[(1 - R)^{-0.5} * G(PD) + (R/(1 - R))^{0.5} * G(0.999)] - PD * LGD) * 12.5 * 1.06$

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

Risk-weighted exposure amount = RW * exposure value

For PD = 1 (defaulted exposure), RW shall be: Max{0, 12.5 *(LGD-EL_{BE})}

where EL_{BE} shall be the credit institution's best estimate of expected loss for the defaulted exposure according to paragraph 2.2.41 of Section II.5 of Appendix 2.

1.3.2 The risk weighted exposure amount for each exposure to small and medium sized entities as defined in paragraph 21.0 of Section II.1 of Appendix 2 which meets the requirements set out in paragraph 2.2.1 of Section III.2 and paragraph 2.5.1 of Section III.3 of Appendix 2 may be calculated according to paragraph 1.2.2 above.

1.3.3 For retail exposures secured by real estate collateral a correlation (R) of 0.15 shall replace the figure produced by the correlation formula in paragraph 1.3.1.

1.3.4 For qualifying revolving retail exposures as defined in (a) to (e), a correlation (R) of 0.04 shall replace the figure produced by the correlation formula in paragraph 1.3.1.

Exposures shall qualify as qualifying revolving retail exposures if they meet the following conditions:

(a) The exposures are to individuals

(b) The exposures are revolving, unsecured, and to the extent they are not drawn immediately and unconditionally cancellable by the credit institution (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 credit institution). Undrawn commitments may be considered as unconditionally cancellable if the terms permit the credit institution to cancel them to the full extent allowable under consumer protection and related legislation.

(c) The maximum exposure to a single individual in the sub-portfolio is EUR 100,000 or less.

(d) The credit institution can demonstrate that the use of the correlation formula of this paragraph is constrained to portfolios that have exhibited low volatility of loss rates, relative to their average level of loss rates, especially within the low PD bands. Supervisors shall review the relative volatility of loss rates across the qualifying revolving retail subportfolios, as well the aggregate qualifying revolving retail portfolio, and intend to share information on the typical characteristics of qualifying revolving retail loss rates across jurisdictions.

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

By way of derogation from point (b), the authority may waive the requirement that the exposure be unsecured in respect of collateralised credit facilities linked to a wage account. In this case amounts recovered from the collateral shall not be taken into account in the LGD estimate.

1.3.5 To be eligible for the retail treatment purchased receivables shall comply with the minimum requirements set out in paragraphs 2.2.64 to 2.2.68 of Appendix 2 Section II.5 and the following conditions:

(a) The credit institution has purchased the receivables from unrelated, third party sellers, and its exposure to the obligor of the receivable does not include any exposures that are directly or indirectly originated by the credit institution itself.

(b) The purchased receivables shall be generated on an arm's-length basis between the seller and the obligor. As such, intercompany accounts receivables and receivables subject to contra-accounts between firms that buy and sell to each other are ineligible.
(c) The purchasing credit institution has a claim on all proceeds from the purchased receivables or a *pro-rata* interest in the proceeds.
(d) The portfolio of purchased receivables is sufficiently diversified.

1.3.6 For purchased receivables, refundable purchase discounts, collateral or partial guarantees that provide first-loss protection for default losses, dilution losses, or both, may be treated as first-loss positions under the IRB securitisation framework.

1.3.7 For hybrid pools of purchased retail receivables where purchasing credit institutions cannot separate exposures secured by real estate collateral and qualifying revolving retail exposures from other retail exposures, the retail risk weight function producing the highest capital requirements for those exposures shall apply.

1.4.0 Risk weighted exposure amounts for equity exposures:

1.4.1 A credit institution may employ different approaches to different portfolios where the credit institution itself uses different approaches internally. Where a credit institution uses different approaches, the credit institution shall demonstrate to the authorities that the choice is made consistently and is not determined by regulatory arbitrage considerations.

1.4.2 Notwithstanding paragraph 1.4.1, the authority may allow the attribution of risk weighted exposure amounts for equity exposures to ancillary services undertakings according to the treatment of other non credit-obligation assets.

Simple Risk Weight Approach

1.4.3 The risk weighted exposure amounts shall be calculated according to the following formula:

Risk weight (RW) = 190% for private equity exposures in sufficiently diversified portfolios.

Risk weight (RW) = 290% for exchange traded equity exposures.

Risk weight (RW) = 370% for all other equity exposures.

Risk-weighted exposure amount = RW * exposure value

1.4.4 Short cash positions and derivative instruments held in the non-trading 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 exposures and that they provide a hedge for at least another 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 method is that for corporate exposures.

1.4.5 Credit institutions may recognise unfunded credit protection obtained on an equity exposure in accordance with the credit risk mitigation methods set out in Appendix 2 Section III.1.

PD/LGD Approach

1.4.6 The risk weighted exposure amounts shall be calculated according to the formulas in paragraph 1.2.1. If credit institutions do not have sufficient information to use the definition of default set out in paragraphs 2.1.1 to 2.1.4 of Section II.5, a scaling factor of 1.5 shall be applied to the risk weights.

1.4.7 At the individual exposure level the sum of the expected loss amount multiplied by 12.5 and the risk weighted exposure amount shall not exceed the exposure value multiplied by 12.5.

1.4.8 Credit institutions may recognise unfunded credit protection obtained on an equity exposure in accordance with the methods set out in of Section III.1 of Appendix 2. This shall be subject to an LGD of 90% on the exposure to the provider of the hedge. For private equity exposures in sufficiently diversified portfolios an LGD of 65% may be used. For these purposes M shall be 5 years.

Internal Models Approach

1.4.9 The risk weighted exposure amounts shall be the potential loss on the credit institution's equity exposures as derived using internal value-at-risk models subject to the 99th percentile, one-tailed confidence interval of the difference between quarterly returns and an appropriate risk-free rate computed over a long-term sample period, multiplied by 12.5. The risk weighted exposure amounts at the individual exposure level shall not be less than the total of the sums of minimum risk weighted exposure amounts required under the PD/LGD Approach and the corresponding expected loss amounts multiplied by 12.5 and calculated on the basis of the PD values set out in paragraph 3.1.1 of Appendix 2 Section II.3 and the corresponding LDG values set out in paragraphs 3.2.1 and 3.2.2 of Appendix 2 Section II.3.

1.4.10 Credit institutions may recognise unfunded credit protection obtained on an equity position.

1.5.0 Risk weighted exposure amounts for other non credit-obligation assets

1.5.1 The risk weighted exposure amounts shall be calculated according to the formula:

Risk-weighted exposure amount = 100% * exposure value

except for when the exposure is a residual value of leased property, in which case it shall be calculated as follows:

1/t * 100% * exposure value

where t is the number of years of the lease contract term.

2.0.0 CALCULATION OF RISK WEIGHTED EXPOSURE AMOUNTS FOR DILUTION RISK OF PURCHASED RECEIVABLES

2.1.0 Risk weights for dilution risk of purchased corporate and retail receivables:
The risk weights shall be calculated according to the formula in paragraph 1.2.1. The input parameters PD and LGD shall be determined as set out in Appendix 2 Section II.3, the exposure value shall be determined as set out in Appendix 2 section II.4 and M shall be 1 year. If credit institutions can demonstrate to the authorities that dilution risk is immaterial, it need not be recognised.

3.0.0 CALCULATION OF EXPECTED LOSS AMOUNTS

3.1.0 Unless noted otherwise, the input parameters PD and LGD shall be determined as set out in Appendix 2 Section II.3, the exposure value shall be determined as set out in Appendix 2 Section II.4.

3.2.0 The expected loss amounts for exposures to corporates, institutions, central governments and central banks and retail exposures shall be calculated according to the following formulas:
Expected loss (EL) = PD × LGD
Expected loss amount = EL × exposure value

For defaulted exposures (PD =1) where credit institutions use own estimates of LGDs, EL shall be EL_{BE}, the credit institution's best estimate of expected loss for the defaulted exposure according to paragraph 2.2.41 of Section II.5 of this Appendix.
For exposures subject to the treatment set out in paragraph 1.2.2 of Section II.2, EL shall be 0.

3.3.0. The EL values for specialised lending exposures where credit institutions use the methods set out in paragraph 1.2.4 for assigning risk weights shall be assigned according to table 2.

Table 2

Remaining Maturity	category 1	category 2	category 3	category 4	category 5
Less than 2.5 years	0%	0.4%	2.8%	8%	50%
Equal or more than 2.5 years	0.4%	0.8%	2.8%	8%	50%

Where authorities have authorised a credit institution to generally assign preferential risk weights of 50% to exposures in category 1, and 70% to exposures in category 2, the EL value for exposures in category 1 shall be 0%, and for exposures in category 2 shall be 0.4%.

3.4.0 The expected loss amounts for equity exposures where the risk weighted exposure amounts are calculated according to the methods set out in paragraphs 1.4.3 to 1.4.5, shall be calculated according to the following formula:

Expected loss amount = EL × exposure value

The EL values shall be the following:

Expected loss (EL) =	0.8% for private equity exposures in sufficiently diversified portfolios
Expected loss (EL) =	0.8% for exchange traded equity exposures.
Expected loss (EL) =	2.4% for all other equity exposures.

3.5.0 The expected loss amounts for equity exposures where the risk weighted exposure amounts are calculated according to the methods set out in paragraphs 1.4.6 to 1.4.8 shall be calculated according to the following formulas:

Expected loss (EL) = PD × LGD
Expected loss amount = EL × exposure value

3.6.0 The expected loss amounts for equity exposures where the risk weighted exposure amounts are calculated according to the methods set out in paragraphs 1.4.9 to 1.4.10 shall be 0%.

3.7.0 The expected loss amounts for dilution risk of purchased receivables shall be calculated according to the following formula:

Expected loss (EL) = PD × LGD
Expected loss amount = EL × exposure value

4.0.0 TREATMENT OF EXPECTED LOSS AMOUNTS

4.1.0. The expected loss amounts calculated in accordance with paragraphs 3.2.0, 3.3.0 and 3.7.0 shall be subtracted from the sum of value adjustments and provisions related to these exposures. Discounts on balance sheet exposures purchased when in default according to paragraph 1.1 of Section II.4 shall be treated in the same manner as value adjustments. Expected loss amounts for securitised exposures and value adjustments and provisions related to these exposures shall not be included in this calculation.

SECTION II.3 - CREDIT RISK: *INTERNAL RATINGS BASED APPROACH PD, LGD and Maturity*

The input parameters probability of default (PD), loss given default (LGD) and maturity value (M) into the calculation of risk weighted exposure amounts and expected loss amounts specified in Section II.2 shall be those estimated by the credit institution in accordance with Section II.5 subject to the following provisions.

1.0.0 EXPOSURES TO CORPORATES, INSTITUTIONS AND CENTRAL GOVERNMENTS AND CENTRAL BANKS

1.1.0 PD

1.1.1. The PD of an exposure to a corporate or an institution shall be at least 0.03%.

1.1.2 For purchased corporate receivables in respect of which a credit institution cannot demonstrate that its PD estimates meet the minimum requirements set out in Section II.5, the PDs for these exposures shall be determined according to the following methods: for senior claims on purchased corporate receivables PD shall be the credit institutions estimate of EL divided by LGD for these receivables. For subordinated claims on purchased corporate receivables PD shall be the credit institutions estimate of EL. If a credit institution is permitted to use own LGD estimates for corporate exposures and it can decompose its EL estimates for purchased corporate receivables into PDs and LGDs in a reliable manner, the PD estimate may be used.

1.1.3 The PD of obligors in default shall be 100%.

1.1.4 Credit institutions may recognise unfunded credit protection in the PD in accordance with the provisions of Appendix 2 Section III.1. For dilution risk, however, the authority may recognise as eligible unfunded protection providers other than those indicated in Appendix 2 Section III.2.

1.1.5 Credit institutions using own LGD estimates may recognise unfunded credit protection by adjusting PDs subject to paragraph 1.2.3.

1.1.6 For dilution risk of purchased corporate receivables PD shall be set equal to EL estimate for dilution risk. If a credit institution is permitted to use own LGD estimates for corporate exposures and it can decompose its EL estimates for dilution risk of purchased corporate receivables into PDs and LGDs in a reliable manner, the PD estimate may be used. Credit institutions may recognise unfunded credit protection in the PD in accordance with the provisions of Appendix 2 Section III.1. Authorities may recognise as eligible unfunded protection providers other than those indicated in Appendix 2 Section III.2. If a credit institution is permitted to use own LGD estimates for dilution risk of purchased corporate receivables, it may recognise unfunded protection by adjusting PDs subject to the provisions of paragraph 1.2.3.

1.2.0 LGD

1.2.1 Credit institutions shall use the following LGD values:

(a) Senior exposures without eligible collateral: 45%.

(b) Subordinated exposures without eligible collateral: 75%.

(c) Credit institutions may recognise funded and unfunded credit protection in the LGD in accordance with the provisions of Appendix 2 Section III.1.

(d) Covered bonds as defined in paragraphs 12.1, 12.6 and 12.7 of Appendix 2 Section I.2 may be assigned an LGD value of 11.25%.

(e) For senior purchased corporate receivables exposures where a credit institution cannot demonstrate that its PD estimates meet the minimum requirements set out in Section II.5, 45%.

(f) For subordinated purchased corporate receivables exposures where a credit institution cannot demonstrate that its PD estimates meet the minimum requirements set out in Section II.5, 100%.

(g) For dilution risk of purchased corporate receivables: 75%

1.2.2 Notwithstanding paragraph 1.2.1, for dilution and default risk if a credit institution is permitted to use own LGD estimates for corporate exposures and it can decompose its EL estimates for purchased corporate receivables into PDs and LGDs in a reliable manner, the LGD estimate for purchased corporate receivables may be used.

1.2.3 Notwithstanding paragraph 1.2.1, if a credit institution is permitted to use own LGD estimates for exposures to corporates, institutions, central governments and central banks, unfunded credit protection may be recognised by adjusting PD and/or LGD subject to minimum requirements as specified in Section II.5 and approval of authorities. A credit institution shall not assign guaranteed exposures an adjusted PD or LGD such that the adjusted risk weight would be lower than that of a comparable, direct exposure to the guarantor.

1.2.4. Notwithstanding paragraph 1.2.1 and 1.2.3, for the purposes of paragraph 1.2.2 of Appendix 2 Section II.2, the LGD of a comparable direct exposure to the protection provider shall either be the LGD associated with an unhedged facility to the guarantor or the unhedged facility of the obligor, depending upon whether in the event both the guarantor and obligor default during the life of the hedged transaction available evidence and the structure of the guarantee indicate that the amount recovered would depend on the financial condition of the guarantor or obligor, respectively.

1.3.0 Maturity

1.3.1 Subject to paragraph 1.3.2, credit institutions shall assign to exposures arising from repurchase transactions or securities or commodities lending or borrowing transactions a maturity value (M) of 0.5 years and to all other exposures an M of 2.5 years. The authority may require all credit institutions in Malta to use M for each exposure as set out under paragraph 1.3.2.

1.3.2 Credit institutions permitted to use own LGDs or own conversion factors for exposures to corporates, institutions or central governments and central banks shall calculate M for each of these exposures as set out in (a) to (e) and subject to paragraphs 1.3.3 to 1.3.5. In all cases, M shall be no greater than 5 years.

(a) For an instrument subject to a cash flow schedule M shall be calculated according to the following formula:

$$M = MAX\{1; MIN\{\sum_t t * CF_t / \sum_t CF_t \quad ; 5\}\}$$

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

(b) For derivatives subject to a master netting agreement M shall be the weighted average remaining maturity of the exposure, where M shall be at least 1 year. The notional amount of each exposure shall be used for weighting the maturity.

(c) For exposures arising from fully or nearly-fully collateralised derivative instruments (listed in Annex III) transactions, and fully or nearly-fully collateralised margin lending transactions which are subject to a master netting agreement, M shall be the weighted average remaining maturity of the transactions where M shall be at least 10 days. For repurchase transactions or securities or commodities lending or borrowing transactions which are subject to a master netting agreement, M shall be the weighted average remaining maturity of the transactions where M shall be at least 5 days. The notional amount of each transaction shall be used for weighting the maturity.

(d) If a credit institution is permitted to use own PD estimates for purchased corporate receivables, for drawn amounts M shall equal the purchased receivables exposure weighted average maturity, where M shall be at least 90 days. This same value of M shall 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 credit institution 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, M for undrawn amounts shall be calculated as the sum of the longest-dated potential receivable under the purchase agreement and the remaining maturity of the purchase facility, where M shall be at least 90 days.

(e) For any other instrument than mentioned in this paragraph or when a credit institution is not in a position to calculate M as set out in (a), M shall be the maximum remaining time (in years) that the obligor is permitted to take to fully discharge its contractual obligations, where M shall be at least 1 year.

(f) for credit institutions using the Internal Model Method set out in Annex IV to calculate the exposure values, M shall be calculated for exposures to which they apply this method and for which the maturity of the longest-dated contract contained in the netting set is greater than one year according to the following formula:

$$M = MIN\left(\frac{\sum_{k=1}^{tk\leq 1year} EffectiveEE_k * \Delta t_k * df_k + \sum_{tk>1year}^{maturity} EE_k * \Delta t_k * df_k}{\sum_{k=1}^{tk\leq 1year} EffectiveEE_k * \Delta t_k * df_k};5\right)$$

where:

df_k = the risk-free discount factor for future time period tk and the remaining symbols are defined in Annex IV Method 4.

Notwithstanding the above, a credit institution that uses an internal model to calculate a one-sided credit valuation adjustment (CVA) may use, subject to the approval of the authority, the effective credit duration estimated by such a model as M.

Subject to paragraph 1.3.3, for netting sets in which all contracts have an original maturity of less than one year the formula in sub-paragraph (a) shall apply.

(g) For the purposes of paragraph 1.2.2 of Appendix 2 Section II.2, M shall be the effective maturity of the credit protection but at least 1 year.

1.3.3 Notwithstanding paragraph 1.3.2 (a), (b), (c), (d) and (e), M shall be at least one-day for:

– fully or nearly-fully collateralised derivative instruments listed in Annex III;

– fully or nearly-fully collateralised margin lending transactions; and

– repurchase transactions, securities or commodities lending or borrowing transactions,

provided the documentation requires daily remargining and daily revaluation and includes provisions that allow for the prompt liquidation or setoff of collateral in the event of default or failure to re-margin.

In addition, for other short-term exposures specified by the authorities which are not part of the credit institution’s ongoing financing of the obligor, M shall be at least one-day. A careful review of the particular circumstances shall be made in each case.

1.3.4 The authority may allow for exposures to corporates situated in the Community and having consolidated sales and consolidated assets of less than EUR 500 million the use of M as set out in paragraph 1.3.1.

1.3.5 Maturity mismatches shall be treated as specified in Appendix 2 Section III.1.

2.0.0 RETAIL EXPOSURES

2.1.0 PD

2.1.1 The PD of an exposure shall be at least 0.03%.

2.1.2 The PD of obligors or where an obligation approach is used those of exposures in default shall be 100%.

2.1.3. For dilution risk of purchased receivables PD shall be set equal to EL estimates for dilution risk. If a credit institution can decompose its EL estimates for dilution risk of purchased receivables into PDs and LGDs in a reliable manner, the PD estimate may be used.

2.1.4 Unfunded credit protection may be recognised by adjusting PDs subject to paragraph 2.2.2. For dilution risk, where credit institutions do not use own estimates of LGDs, this shall be subject to compliance with Appendix 2 Section III.1; for this purpose authorities may recognise as eligible unfunded protection providers other than those indicated in Appendix 2 Section III.2.

2.2.0 LGD

2.2.1 Credit institutions shall provide own estimates of LGDs subject to minimum requirements as specified in Section II.5 and approval of authorities. For dilution risk of purchased receivables an LGD value of 75% shall be used. If a credit institution can decompose its EL estimates for dilution risk of purchased receivables into PDs and LGDs in a reliable manner, the LGD estimate may be used.

2.2.2 Unfunded credit protection may be recognised by adjusting PD or LGD estimates subject to minimum requirements as specified in paragraphs 2.2.57 to 2.2.64 of Appendix 2 Section II.5 and approval of the authority either in support of an individual exposure or a pool of exposures. A credit institution shall not assign guaranteed exposures an adjusted PD or LGD such that the adjusted risk weight would be lower than that of a comparable, direct exposure to the guarantor.

2.2.3 Notwithstanding paragraph 2.2.2 for the purposes of paragraph 1.3.2 of Appendix 2 Section II.2, the LGD of a comparable direct exposure to the protection provider shall either be the LGD associated with an unhedged facility to the guarantor or the unhedged facility of the obligor, depending upon whether in the event both the guarantor and obligor default during the life of the hedged transaction available evidence and the structure of the guarantee indicate that the amount recovered would depend on the financial condition of the guarantor or obligor, respectively.

3.0.0 EQUITY EXPOSURES SUBJECT TO PD/LGD METHOD

3.1.0 PD

3.1.1. PDs shall be determined according to the methods for corporate exposures. However, the following minimum PDs shall apply:

(a) 0.09% for exchange traded equity exposures where the investment is part of a long-term customer relationship;

(b) 0.09% for non-exchange traded equity exposures where the returns on the investment are based on regular and periodic cash flows not derived from capital gains;

(c) 0.40% for exchange traded equity exposures including other short positions as set out in paragraph 1.4.4 of Appendix 2 section II.2.

(d) 1.25% for all other equity exposures including other short positions as set out in paragraph 1.4.4 of Appendix 2 section II.2.

3.2.0 LGD

3.2.1 Private equity exposures in sufficiently diversified portfolios may be assigned an LGD of 65 %.

3.2.2 All other exposures shall be assigned an LGD of 90 %.

3.3.0 Maturity

3.3.1 M assigned to all exposures shall be 5 years.

SECTION II.4 - CREDIT RISK: *INTERNAL RATINGS BASED APPROACH* *Exposure Value*

1.0 EXPOSURES TO CORPORATES, INSTITUTIONS, CENTRAL GOVERNMENTS AND CENTRAL BANKS AND RETAIL EXPOSURES.

1.1 Unless noted otherwise the exposure value of on-balance sheet exposures shall be measured gross of value adjustments. This rule also applies to assets purchased at a price different than the amount owed. For purchased assets, the difference between the amount owed and the net value recorded on the balance-sheet of credit institutions is denoted discount if the amount owed is larger, and premium if it is smaller.

1.2 Where credit institutions use Master netting agreements in relation to repurchase transactions or securities or commodities lending or borrowing transactions the exposure value shall be calculated in accordance with Appendix 2 Section III.1.

1.3 For on-balance sheet netting of loans and deposits credit institutions shall apply for the calculation of the exposure value the methods set out in Appendix 2 Section III.1.

1.4 The exposure value for leases shall be the discounted minimum lease payments.

Minimum lease payments are the payments over the lease term that the lessee is or can be required to make and any bargain option (i.e. option the exercise of which is reasonably certain). Any guaranteed residual value fulfilling the set of conditions in paragraphs 2.1.1 and 2.1.2 of Appendix 2 Section III.2 regarding the eligibility of protection providers as well as the minimum requirements for recognising other types of guarantees provided in paragraphs 2.1.1 to 2.3.2 of Appendix 2 Section III.3 should also be included in the minimum lease payments.

1.5 In the case of any item listed in Annex III, the exposure value shall be determined by the methods set out in Annex IV.

1.6 The exposure value for the calculation of risk weighted exposure amounts of purchased receivables shall be the outstanding amount minus the capital requirements for dilution risk prior to credit risk mitigation.

1.7 Where an exposure takes the form of securities or commodities sold, posted or lent under repurchase transactions or securities or commodities lending or borrowing transactions, long settlement transactions and margin lending transactions, the exposure value shall be the value of the securities or commodities determined in accordance with the accounting framework to which the credit institution is subject. Where the Financial Collateral Comprehensive Method as set out under Section III.4 is used, the exposure value shall be increased by the volatility adjustment appropriate to such securities or commodities as set out therein. The exposure value of repurchase transactions, securities or commodities lending or borrowing transactions, long settlement transactions and margin lending transactions may be determined either in accordance with Annex IV or Appendix 2 Section III.4 paragraph 1.3.8 to 1.3.17.

1.8 Notwithstanding paragraph 1.7, the exposure value of credit risk exposures outstanding, as determined by the authorities, with a central counterparty shall be determined in accordance with paragraph 6 of Annex IV, provided that the central counterparty's counterparty credit risk exposures with all participants in its arrangements are fully collateralised on a daily basis.

1.9 The exposure value for the following items, shall be calculated as the committed but undrawn amount multiplied by a conversion factor. Credit institutions shall use the following conversion factors:

(a) for credit lines which are uncommitted, that are unconditionally cancellable at any time by the credit institution without prior notice, or that effectively provide for automatic cancellation due to deterioration in a borrower's credit worthiness, a conversion factor of 0% shall apply. To apply a conversion factor of 0% credit institutions shall actively monitor the financial condition of the obligor, and their internal control systems shall enable them to immediately detect a deterioration in the credit quality of the obligor. Undrawn retail credit lines may be considered as unconditionally cancellable if the terms permit the credit institution to cancel them to the full extent allowable under consumer protection and related legislation.

(b) For short-term letters of credit arising from the movement of goods, a conversion factor of 20% shall apply for both the issuing and confirming institutions.

(c) For undrawn purchase commitments for revolving purchased receivables that are unconditionally cancellable or that effectively provide for automatic cancellation at any time by the institution without prior notice, a conversion factor of 0 % shall apply. To apply a conversion factor of 0%, credit institutions shall actively monitor the financial condition of the obligor, and their internal control systems shall enable them to immediately detect a deterioration in the credit quality of the obligor;

(d) For other credit lines, note issuance facilities (NIFs), and revolving underwriting facilities (RUFs), a conversion factor of 75% shall apply.

(e) Credit institutions which meet the minimum requirements for the use of own estimates of conversion factors as specified in Appendix 2 Section II.5 may use their own estimates of conversion factors across different product types as mentioned in points (a) (b), (c) and (d) above, subject to approval of the authorities.

1.10 Where a commitment refers to the extension of another commitment, the lower of the two conversion factors associated with the individual commitment shall be used.

1.11 For all off-balance sheet items other than mentioned in paragraphs 1.1 to 1.9, the exposure value shall be the following percentage of its value:

> 100% if it is a full risk item,
> 50% if it is a medium-risk item,
> 20% if it is a medium/low-risk item, and
> 0% if it is a low-risk item.

For these purposes the off-balance sheet items shall be assigned to risk categories as indicated in Annex II.

2.0 EQUITY EXPOSURES

2.1 The exposure value shall be the value presented in the financial statements. Admissible equity exposure measures are the following:

(a) For investments held at fair value with changes in value flowing directly through income and into own funds, the exposure value is the fair value presented in the balance sheet.

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

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

3.0 OTHER NON CREDIT-OBLIGATION ASSETS

3.1 The exposure value of other non credit-obligation assets shall be the value presented in the financial statements.

SECTION II.5 - CREDIT RISK: *INTERNAL RATINGS BASED APPROACH*
Minimum Requirements for IRB Approach

1.0.0 RATING SYSTEMS

1.0.1 A 'rating system' shall comprise all of the methods, processes, controls, data collection and IT systems that support the assessment of credit risk, the assignment of exposures to grades or pools (rating), and the quantification of default and loss estimates for a certain type of exposure.

1.0.2 If a credit institution uses multiple rating systems, the rationale for assigning an obligor or a transaction to a rating system shall be documented and applied in a manner that appropriately reflects the level of risk.

1.0.3 Assignment criteria and processes shall be periodically reviewed to determine whether they remain appropriate for the current portfolio and external conditions.

1.1.0 Structure of rating systems

1.1.1. Where a credit institution uses direct estimates of risk parameters these may be seen as the outputs of grades on a continuous rating scale.

Exposures to corporates, institutions and central governments and central banks

1.1.2 A rating system shall take into account obligor and transaction risk characteristics.

1.1.3 A rating system shall have an obligor rating scale which reflects exclusively quantification of the risk of obligor default. The obligor rating scale shall have a minimum of 7 grades for non-defaulted obligors and one for defaulted obligors.

1.1.4 An 'obligor grade' shall mean a risk category within a rating system's obligor rating scale, to which obligors are assigned on the basis of a specified and distinct set of rating criteria, from which estimates of PD are derived. A credit institution shall document the relationship between obligor grades in terms of the level of default risk each grade implies and the criteria used to distinguish that level of default risk.

1.1.5 Credit institutions with portfolios concentrated in a particular market segment and range of default risk shall have enough obligor grades within that range to avoid undue concentrations of obligors in a particular grade. Significant concentrations within a single grade shall be supported by convincing empirical evidence that the obligor grade covers a reasonably narrow PD band and that the default risk posed by all obligors in the grade falls within that band.

1.1.6 To qualify for recognition by the authorities of the use for capital requirement calculation of own estimates of LGDs a rating system shall incorporate a distinct facility rating scale which exclusively reflects LGD related transaction characteristics.

1.1.7 A 'facility grade' shall mean a risk category within a rating system's facility scale, to which exposures are assigned on the basis of a specified and distinct set of rating criteria from which own estimates of LGDs are derived. The grade definition shall include both a description of how exposures are assigned to the grade and of the criteria used to distinguish the level of risk across grades.

1.1.8 Significant concentrations within a single facility grade shall be supported by convincing empirical evidence that the facility grade covers a reasonably narrow LGD band, and that the risk posed by all exposures in the grade falls within that band.

1.1.9 Credit institutions using the methods set out in paragraph 1.2.4 of Appendix 2 Section II.2 for assigning risk weights for specialised lending exposures are exempt from the requirement to have an obligor rating scale which reflects exclusively quantification of the risk of obligor default for these exposures. Notwithstanding paragraph 1.1.3, these institutions shall have for these exposures at least 4 grades for non-defaulted obligors and at least one grade for defaulted obligors.

Retail exposures

1.1.10 Rating systems shall reflect both obligor and transaction risk, and shall capture all relevant obligor and transaction characteristics.

1.1.11 The level of risk differentiation shall ensure that the number of exposures in a given grade or pool is sufficient to allow for meaningful quantification and validation of the loss characteristics at the grade or pool level. The distribution of exposures and obligors across grades or pools shall be such as to avoid excessive concentrations.

1.1.12 Credit institutions shall demonstrate that the process of assigning exposures to grades or pools provides for a meaningful differentiation of risk, provides for a grouping of sufficiently homogenous exposures, and allows for accurate and consistent estimation of loss characteristics at grade or pool level. For purchased receivables the grouping shall reflect the seller's underwriting practices and the heterogeneity of their customers.

1.1.13 Credit institutions shall consider the following risk drivers when assigning exposures to grades or pools:

(a) Obligor risk characteristics

(b) Transaction risk characteristics, including product or collateral types or both. Credit institutions shall explicitly address cases where several exposures benefit from the same collateral

(c) Delinquency, unless the credit institution demonstrates to its authority that delinquency is not a material driver of risk for the exposure

Assignment to grades or pools

1.1.14 A credit institution shall have specific definitions, processes and criteria for assigning exposures to grades or pools within a rating system.

(a) The grade or pool definitions and criteria shall be sufficiently detailed to allow those charged with assigning ratings to consistently assign obligors or facilities posing similar risk to the same grade or pool. This consistency shall exist across lines of business, departments and geographic locations.

(b) The documentation of the rating process shall allow third parties to understand the assignments of exposures to grades or pools, to replicate grade and pool assignments and to evaluate the appropriateness of the assignments to a grade or a pool.

(c) The criteria shall also be consistent with the credit institution's internal lending standards and its policies for handling troubled obligors and facilities.

1.1.15 A credit institution shall take all relevant information into account in assigning obligors and facilities to grades or pools. Information shall be current and shall enable the credit institution to forecast the future performance of the exposure. The less information a credit institution has, the more conservative shall be its assignments of exposures to obligor and facility grades or pools. If a credit institution uses an external rating as a primary factor determining an internal rating assignment, the credit institution shall ensure that it considers other relevant information.

1.2.0 Assignment of exposures

Exposures to corporates, institutions and central governments and central banks

1.2.1 Each obligor shall be assigned to an obligor grade as part of the credit approval process.

1.2.2 For those credit institutions permitted to use own estimates of LGDs or conversion factors, each exposure shall also be assigned to a facility grade as part of the credit approval process.

1.2.3 Credit institutions using the methods set out in paragraph 1.2.4 of Appendix 2 Section II.2 for assigning risk weights for specialised lending exposures shall assign each of these exposures to a grade in accordance with paragraph 1.1.9.

1.2.4 Each separate legal entity to which the credit institution is exposed shall be separately rated. A credit institution shall demonstrate to its authority that it has acceptable policies regarding the treatment of individual obligor clients and groups of connected clients.

1.2.5 Separate exposures to the same obligor shall be assigned to the same obligor grade, irrespective of any differences in the nature of each specific transaction. Exceptions, where separate exposures are allowed to result in multiple grades for the same obligor are:

(a) country transfer risk, this being dependent on whether the exposures are denominated in local or foreign currency

(b) where the treatment of associated guarantees to an exposure may be reflected in an adjusted assignment to an obligor grade

(c) where consumer protection, bank secrecy or other legislation prohibit the exchange of client data.

Retail exposures

1.2.6 Each exposure shall be assigned to a grade or a pool as part of the credit approval process.

Overrides

1.2.7 For grade and pool assignments credit institutions shall document the situations in which human judgement may override the inputs or outputs of the assignment process and the personnel that are responsible for approving these overrides. Credit institutions shall document these overrides and the personnel responsible. Credit institutions shall analyse the performance of the exposures whose assignments have been overridden. This analysis shall include assessment of the performance of exposures whose rating has been overridden by a particular person, accounting for all the responsible personnel.

1.3.0 Integrity of assignment process

Exposures to corporates, institutions and central governments and central banks

1.3.1 Assignments and periodic reviews of assignments shall be completed or approved by an independent party that does not directly benefit from decisions to extend the credit.

1.3.2 Credit institutions shall update assignments at least annually. High risk obligors and problem exposures shall be subject to more frequent review. Credit institutions shall undertake a new assignment if material information on the obligor or exposure becomes available.

1.3.3 A credit institution shall have an effective process to obtain and update relevant information on obligor characteristics that affect PDs, and on transaction characteristics that affect LGDs and conversion factors.

Retail exposures

1.3.4 A credit institution shall at least annually update obligor and facility assignments or review the loss characteristics and delinquency status of each identified risk pool whichever applicable. A credit institution shall also at least annually review in a representative sample the status of individual exposures within each pool as a means of ensuring that exposures continue to be assigned to the correct pool.

1.4.0 Use of models

1.4.1 If a credit institution uses statistical models and other mechanical methods to assign exposures to obligors or facilities grades or pools, then:

(a) The credit institution shall demonstrate to its authority that the model has good predictive power and that capital requirements are not distorted as a result of its use. The input variables shall form a reasonable and effective basis for the resulting predictions. The model shall not have material biases.

(b) The credit institution shall have in place a process for vetting data inputs into the model which includes an assessment of the accuracy, completeness and appropriateness of the data.

(c) The credit institution shall demonstrate that the data used to build the model is representative of the population of the credit institution's actual obligors or exposures.

(d) The credit institution shall have a regular cycle of model validation that includes monitoring of model performance and stability; review of model specification; and testing of model outputs against outcomes.

(e) The credit institution shall complement the statistical model by human judgement and human oversight to review model-based assignments and to ensure that the models are used appropriately. Review procedures shall aim at finding and limiting errors associated with model weaknesses. Human judgements shall take into account all relevant information not considered by the model. The credit institution shall document how human judgement and model results are to be combined.

1.5.0 Documentation of rating systems

1.5.1. The credit institutions shall document the design and operational details of its rating systems. The documentation shall evidence compliance with the minimum requirements in this Section, and address topics including portfolio differentiation, rating criteria, responsibilities of parties that rate obligors and exposures, frequency of assignment reviews, and management oversight of the rating process.

1.5.2 The credit institution shall document the rationale for and analysis supporting its choice of rating criteria. A credit institution shall document all major changes in the risk rating process, and such documentation shall support identification of changes made to the risk rating process subsequent to the last review by the authorities. The organisation of rating assignment including the rating assignment process and the internal control structure shall also be documented.

1.5.3 The credit institutions shall document the specific definitions of default and loss used internally and demonstrate consistency with the definitions set out in this Directive.

1.5.4 If the credit institution employs statistical models in the rating process, the credit institution shall document their methodologies. This material shall:

(a) 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;
(b) establish a rigorous statistical process (including out-of-time and out-of-sample performance tests) for validating the model; and
(c) indicate any circumstances under which the model does not work effectively

1.5.5 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 rating systems. The burden is on the credit institution to satisfy authorities.

1.6.0 Data maintenance

1.6.1 Credit institutions shall collect and store data on aspects of their internal ratings as required under Articles 145 to 149 of EU Directive 2006/48/EC.

Exposures to corporates, institutions and central governments and central banks

1.6.2 Credit institutions shall collect and store:

(a) Complete rating histories on obligors and recognised guarantors,

(b) The dates the ratings were assigned,

(c) The key data and methodology used to derive the rating,

(d) The person responsible for the rating assignment,

(e) The identity of obligors and exposures that defaulted,

(f) The date and circumstances of such defaults,

(g) Data on the PDs and realised default rates associated with rating grades and ratings migration,

Credit institutions not using own estimates of LGDs and/or conversion factors shall collect and store data on comparisons of realised LGDs to the values as set out in paragraph 1.2.1 of Appendix 2 Section II.3 and realised conversion factors to the values as set out in paragraph 1.9 of appendix 2 Section II.4.

1.6.3 Credit institutions using own estimates of LGDs and/or conversion factors shall collect and store:

(a) Complete histories of data on the facility ratings and LGD and conversion factor estimates associated with each rating scale,

(b) The dates the ratings were assigned and the estimates were done,

(c) The key data and methodology used to derive the facility ratings and LGD and conversion factor estimates,

(d) The person who assigned the facility rating and the person who provided LGD and conversion factor estimates.

(e) Data on the estimated and realised LGDs and conversion factors associated with each defaulted exposure.

(f) Data on the LGD of the exposure before and after evaluation of the effects of a guarantee/ or credit derivative, for those credit institutions that reflect the credit risk mitigating effects of guarantees or credit derivatives through LGD.

(g) Data on the components of loss for each defaulted exposure.

Retail exposures

1.6.4 Credit institutions shall collect and store:

(a) Data used in the process of allocating exposures to grades or pools,

(b) Data on the estimated PDs, LGDs and conversion factors associated with grades or pools of exposures,

(c) The identity of obligors and exposures that defaulted,

(d) For defaulted exposures, data on the grades or pools to which the exposure was assigned over the year prior to default and the realised outcomes on LGD and conversion factor,

(e) Data on loss rates for qualifying revolving retail exposures.

1.7.0 Stress tests used in assessment of capital adequacy

1.7.1 A credit institution shall have in place sound stress testing processes for use in the assessment of its capital adequacy. Stress testing shall involve identifying possible events or future changes in economic conditions that could have unfavourable effects on a credit institution's credit exposures and assessment of the credit institution's ability to withstand such changes.

1.7.2 A credit institution shall regularly perform a credit risk stress test to assess the effect of certain specific conditions on its total capital requirements for credit risk. The test to be employed shall be one chosen by the credit institution, subject to supervisory review. The test to be employed shall be meaningful and reasonably conservative, considering at least the effect of mild recession scenarios. A credit institution shall assess migration in its ratings under the stress test scenarios. Stressed portfolios shall contain the vast majority of a credit institution's total exposure.

1.7.3 Credit institutions using the treatment set out in paragraph 1.2.2 of Appendix 2 Section II.2 shall consider as part of their stress testing framework the impact of a deterioration in the credit quality of protection providers, in particular the impact of protection providers falling outside the eligibility criteria.

2.0.0 RISK QUANTIFICATION

2.0.1 In determining the risk parameters to be associated with rating grades or pools, credit institutions shall apply the following requirements:

2.1.0 Definition of default

2.1.1 A 'default' shall be considered to have occurred with regard to a particular obligor when either or both of the two following events has taken place:

(a) The credit institution considers that the obligor is unlikely to pay its credit obligations to the credit institution, the parent undertaking or any of its subsidiaries in full, without recourse by the credit institution to actions such as realising security (if held).

(b) The obligor is past due more than 90 days on any material credit obligation to the credit institution, the parent undertaking or any of its subsidiaries.

For *overdrafts*, days past due commence once an obligor has breached an advised limit, has been advised a limit smaller than current outstandings, or has drawn credit without authorisation and the underlying amount is material.

An *advised limit* shall mean a limit which has been brought to the knowledge of the obligor.

Days past due for credit cards commence on the minimum payment due date.

2.1.2 Elements to be taken as indications of unlikeliness to pay shall include:

(a) The credit institution puts the credit obligation on non-accrued status.

(b) The credit institution makes a value adjustment resulting from a significant perceived decline in credit quality subsequent to the credit institution taking on the exposure.

(c) The credit institution sells the credit obligation at a material credit-related economic loss.

(d) The credit institution 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. This includes in the case of equity exposures assessed under a PD/LGD Approach, distressed restructuring of the equity itself.

(e) The credit institution has filed for the obligor's bankruptcy or a similar order in respect of an obligor's credit obligation to the credit institution, the parent undertaking or any of its subsidiaries.

(f) The obligor has sought or has been placed in bankruptcy or similar protection where this would avoid or delay repayment of a credit obligation to the credit institution, the parent undertaking or any of its subsidiaries.

2.1.3 Credit institutions that use external data that is not itself consistent with the definition of default, shall demonstrate to their authorities that appropriate adjustments have been made to achieve broad equivalence with the definition of default.

2.1.4 If the credit institution considers that a previously defaulted exposure is such that no trigger of default continues to apply, the credit institution shall rate the obligor or facility as they would for a non-defaulted exposure. Should the definition of default subsequently be triggered, another default would be deemed to have occurred.

2.2.0 Overall requirements for estimation

2.2.1 A credit institution's own estimates of the risk parameters PD, LGD, conversion factor and EL shall incorporate all relevant data, information and methods. The estimates shall be derived using both historical experience and empirical evidence, and not based purely on judgemental considerations. The estimates shall be plausible and intuitive and shall be based on the material drivers of the respective risk parameters. The less data a credit institution has, the more conservative it shall be in its estimation.

2.2.2 The credit institution shall be able to provide a breakdown of its loss experience in terms of default frequency, LGD, conversion factor, or loss where EL estimates are used, by the factors it sees as the drivers of the respective risk parameters. The credit institution shall demonstrate that its estimates are representative of long run experience.

2.2.3 Any changes in lending practice or the process for pursuing recoveries over the observation periods referred to in paragraphs 2.2.18, 2.2.23, 2.2.33, 2.2.37, 2.2.44, and 2.2.46 shall be taken into account. A credit institution's estimates shall reflect the implications of technical advances and new data and other information, as it becomes available. Credit institutions shall review their estimates when new information comes to light but at least on an annual basis.

2.2.4 The population of exposures represented in the data used for estimation, the lending standards used when the data was generated and other relevant characteristics shall be comparable with those of the credit institution's exposures and standards. The credit institution shall also demonstrate that the economic or market conditions that underlie the data is relevant to current and foreseeable conditions. The number of exposures in the sample and the data period used for quantification shall be sufficient to provide the credit institution with confidence in the accuracy and robustness of its estimates.

2.2.5 For purchased receivables the estimates shall reflect all relevant information available to the purchasing credit institution regarding the quality of the underlying receivables, including data for similar pools provided by the seller, by the purchasing credit institution, or by external sources. The purchasing credit institution shall evaluate any data relied upon from the seller.

2.2.6 A credit institution shall add to its estimates a margin of conservatism that is related to the expected range of estimation errors. Where methods and data are less satisfactory and the expected range of errors is larger, the margin of conservatism shall be larger.

2.2.7 If credit institutions use different estimates for the calculation of risk weights and internal purposes it shall be documented and their reasonableness shall be demonstrated to the authority.

2.2.8 If credit institutions can demonstrate to its authorities that for data that have been collected prior to the date of implementation of this Directive appropriate adjustments have been made to achieve broad equivalence with the definitions of default or loss, authorities may allow the credit institutions some flexibility in the application of the required standards for data.

2.2.9. If a credit institution uses data that is pooled across credit institutions it shall demonstrate that:

(a) The rating systems and criteria of other credit institutions in the pool are similar with its own;

(b) The pool shall be representative for the portfolio for which the pooled data is used;

(c) The pooled data is used consistently over time by the credit institution for its permanent estimates.

2.2.10. If a credit institution uses data that is pooled across credit institutions, it shall remain responsible for the integrity of its rating systems. The credit institution shall demonstrate to the authority that it has sufficient in-house understanding of its rating systems, including effective ability to monitor and audit the rating process.

Requirements specific to PD estimation

Exposures to corporates, institutions and central governments and central banks

2.2.11 Credit institutions shall estimate PDs by obligor grade from long run averages of one-year default rates.

2.2.12 For purchased corporate receivables credit institutions may estimate ELs by obligor grade from long run averages of one-year realised default rates.

2.2.13 If a credit institution derives long run average estimates of PDs and LGDs for purchased corporate receivables from an estimate of EL, and an appropriate estimate of PD or LGD, the process for estimating total losses shall meet the overall standards for estimation of PD and LGD set out in this Part, and the outcome shall be consistent with the concept of LGD as set out in paragraph 2.2.25.

2.2.14 Credit institutions shall use PD estimation techniques only with supporting analysis. Credit institutions shall recognise the importance of judgmental considerations in combining results of techniques and in making adjustments for limitations of techniques and information.

2.2.15 To the extent that a credit institution uses data on internal default experience for the estimation of PDs it shall 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 underwriting standards or rating systems have changed, the credit institution shall add a greater margin of conservatism in its estimate of PD

2.2.16 To the extent that a credit institution associates or maps its internal grades to the scale used by an ECAI or similar organisations and then attributes the default rate observed for the external organisation's grades to the credit institution's grades, mappings shall be based on a comparison of internal rating criteria to the criteria used by the external organisation and on a comparison of the internal and external ratings of any common obligors. Biases or inconsistencies in the mapping approach or underlying data shall be avoided. The external organisation's criteria underlying the data used for quantification shall be oriented to default risk only and not reflect transaction characteristics. The credit institution's analysis shall include a comparison of the default definitions used, subject to the requirements in paragraphs 2.1.1 to 2.1.4. The credit institution shall document the basis for the mapping.

2.2.17 To the extent that a credit institution uses statistical default prediction models it is allowed to estimate PDs as the simple average of default-probability estimates for individual obligors in a given grade. The credit institution's use of default probability models for this purpose shall meet the standards specified in paragraph 1.4.1.

2.2.18 Irrespective of whether a credit institution is using external, internal, or pooled data sources, or a combination of the three, for its PD estimation, the length of the underlying historical observation period used shall 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 is relevant, this longer period shall be used. This paragraph also applies to the PD/LGD Approach to equity. Member States may allow credit institutions which are not permitted to use own estimates of LGDs or conversion factors to have, when they implement the IRB Approach, relevant data covering a period of two years. The period to be covered shall increase by one year each year until relevant data cover a period of five years.

Retail exposures

2.2.19 Credit institutions shall estimate PDs by obligor grade or pool from long run averages of one-year default rates.

2.2.20 Notwithstanding paragraph 67, PD estimates may also be derived from realised losses and appropriate estimates of LGDs.

2.2.21 Credit institutions shall regard internal data for assigning exposures to grades or pools as the primary source of information for estimating loss characteristics. Credit institutions are permitted to use external data (including pooled data) or statistical models for quantification provided a strong link can be demonstrated between:

(a) the credit institution's process of assigning exposures to grades or pools and the process used by the external data source

(b) the credit institution's internal risk profile and the composition of the external data.

For purchased retail receivables credit institutions may use external and internal reference data. Credit institutions shall use all relevant data sources as points of comparison.

2.2.22 If a credit institution derives long run average estimates of PD and LGD for retail from an estimate of total losses, and an appropriate estimate of PD or LGD, the process for estimating total losses shall meet the overall standards for estimation of PD and LGD set out in this Section, and the outcome shall be consistent with the concept of LGD as set out in paragraph 2.2.25.

2.2.23 Irrespective of whether a credit institution is 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 shall be at least five years for at least one source. If the available observation spans a longer period for any source, and these data are relevant, this longer period shall be used. A credit institution need not give equal importance to historic data if it can convince its authority that more recent data is a better predictor of loss rates. Member States may allow credit institutions to have, when they implement the IRB Approach, relevant data covering a period of two years. The period to be covered shall increase by one year each year until relevant data cover a period of five years.

2.2.24 Credit institutions shall identify and analyse expected changes of risk parameters over the life of credit exposures (seasoning effects).

Requirements specific to own-LGD estimates

2.2.25 Credit institutions shall estimate LGDs by facility grade or pool on the basis of the average realised LGDs by facility grade or pool using all observed defaults within the data sources (default weighted average).

2.2.26 Credit institutions shall use LGD estimates that are appropriate for an economic downturn if those are more conservative than the long-run average. To the extent a rating system is expected to deliver constant realised LGDs by grade or pool over time, credit institutions shall make adjustments to their estimates of risk parameters by grade or pool to limit the capital impact of an economic downturn.

2.2.27 A credit institution shall consider the extent of any dependence between the risk of the obligor with that of the collateral or collateral provider. Cases where there is a significant degree of dependence shall be addressed in a conservative manner.

2.2.28 Currency mismatches between the underlying obligation and the collateral shall be treated conservatively in the credit institution's assessment of LGD.

2.2.29 To the extent, that LGD estimates take into account the existence of collateral, these estimates shall not solely be based on the collateral's estimated market value. LGD estimates shall take into account the effect of the potential inability of credit institutions to expeditiously gain control of their collateral and liquidate it.

2.2.30 To the extent that LGD estimates take into account the existence of collateral, credit institutions must establish internal requirements for collateral management, legal certainty and risk management that are generally consistent with those set out in Appendix 2 Section III.3.

2.2.40 To the extent that a credit institution recognises collateral for determining the exposure value for counterparty credit risk according to the Standardised or the Internal Model Methods stipulated in Annex IV, any amount expected to be recovered from the collateral shall not be taken into account in the LGD estimates.

2.2.41 For the specific case of exposures already in default, the credit institution shall use the sum of its best estimate of expected loss for each exposure given current economic circumstances and exposure status and the possibility of additional unexpected losses during the recovery period.

2.2.42 To the extent that unpaid late fees have been capitalised in the credit institution's income statement, they shall be added to the credit institution's measure of exposure and loss.

Exposures to corporates, institutions and central governments and central banks

2.2.43 Estimates of LGD shall be based on data over a minimum of five years, increasing by one year each year after implementation until a minimum of seven years is reached, for at least one data source. If the available observation period spans a longer period for any source, and the data is relevant, this longer period shall be used.

Retail exposures

2.2.44 Notwithstanding paragraph 2.2.25, LGD estimates may be derived from realised losses and appropriate estimates of PDs.

2.2.45 Notwithstanding paragraph 2.2.49, credit institutions may reflect future drawings either in its conversion factor or in its LGD estimates.

2.2.46 For purchased retail receivables credit institutions may use external and internal reference data to estimate LGDs.

2.2.47 Estimates of LGD shall be based on data over a minimum of five years. Notwithstanding paragraph 2.2.25, a credit institution needs not give equal importance to historic data if it can demonstrate to its authority that more recent data is a better predictor of loss rates. Subject to the authority's consent, credit institutions may have relevant data covering a period of two years when they implement the IRB Approach. The period to be covered shall increase by one year each year until relevant data cover a period of five years.

Requirements specific to own-conversion factor estimates

2.2.48 Credit institutions shall estimate conversion factors by facility grade or pool on the basis of the average expected conversion factors by facility grade or pool using all observed defaults within the data sources (default weighted average).

2.2.49 Credit institutions shall use conversion factor estimates that are appropriate for an economic downturn if those are more conservative than the long-run average. To the extent a rating system is expected to deliver constant realised conversion factors by grade or pool over time, credit institutions shall make adjustments to their estimates of risk parameters by grade or pool to limit the capital impact of an economic downturn.

2.2.50 Credit institutions estimates of conversion factor shall reflect the possibility of additional drawings by the obligor up to and after the time a default event is triggered. The conversion factor estimate shall incorporate a larger margin of conservatism where a stronger positive correlation can reasonably be expected between the default frequency and the magnitude of conversion factor.

2.2.51 In arriving at estimates of conversion factors credit institutions shall consider their specific policies and strategies adopted in respect of account monitoring and payment processing. Credit institutions shall also consider their ability and willingness to prevent further drawings in circumstances short of payment default, such as covenant violations or other technical default events.

2.2.52 Credit institutions shall have adequate systems and procedures in place to monitor facility amounts, current outstandings against committed lines and changes in outstandings per obligor and per grade. The credit institution shall be able to monitor outstanding balances on a daily basis.

2.2.53 If credit institutions use different estimates of conversion factors for the calculation of risk weighted exposure amounts and internal purposes it shall be documented and their reasonableness shall be demonstrated to the authority.

Exposures to corporates, institutions and central governments and central banks

2.2.54 Estimates of conversion factors shall be based on data over a minimum of five years, increasing by one year each year after implementation until a minimum of seven years is reached, for at least one data source. If the available observation period spans a longer period for any source, and the data is relevant, this longer period shall be used.

Retail exposures

2.2.55 Notwithstanding paragraph 2.2.50, credit institutions may reflect future drawings either in their conversion factors or in their LGD estimates.

2.2.56 Estimates of conversion factors shall be based on data over a minimum of five years. Notwithstanding paragraph 2.2.48, a credit institution need not give equal importance to historic data if it can demonstrate to its authority that more recent data is a better predictor of draw downs. Subject to the application to the authority, credit institutions may have, when they implement the IRB Approach, relevant data covering a period of two years. The period to be covered shall increase by one year each year until relevant data cover a period of five years.

Minimum requirements for assessing the effect of guarantees and credit derivatives

Exposures to corporates, institutions and central governments and central banks where own estimates of LGD are used and retail exposures.

2.2.57 The requirements in paragraphs 2.2.58 to 2.2.65 shall not apply for guarantees provided by institutions, central governments and central banks, and corporate entities which meet the requirements laid down in Appendix 2 Section III.2 para 2.1.1(g) if the credit institution has received approval to apply the Standardised Approach for exposures to such entities. In this case the requirements of Appendix 2 Section III.1 shall apply.

2.2.58 For retail guarantees, these requirements also apply to the assignment of exposures to grades or pools, and the estimation of PD.

Eligible guarantors and guarantees

2.2.59 Credit institutions shall have clearly specified criteria for the types of guarantors they recognise for the calculation of risk weighted exposure amounts.

2.2.60. For recognised guarantors the same rules as for obligors as set out in paragraphs 1.1.14 to 1.3.4 shall apply.

2.2.61 The guarantee shall be evidenced in writing, non-cancellable on the part of the guarantor, in force until the obligation 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. Guarantees prescribing conditions under which the guarantor may not be obliged to perform (conditional guarantees) may be recognised subject to approval of authorities. The credit institution shall demonstrate that the assignment criteria adequately address any potential reduction in the risk mitigation effect.

Adjustment criteria

2.2.61 A credit institution shall have clearly specified criteria for adjusting grades, pools or LGD estimates, and in the case of retail and eligible purchased receivables, the process of allocating exposures to grades or pools, to reflect the impact of guarantees for the calculation of risk weighted exposure amounts. These criteria shall comply with the minimum requirements set out in paragraphs 1.1.14 to 1.3.4

2.2.62 The criteria shall be plausible and intuitive. They shall address the guarantor's ability and willingness to perform under the guarantee, the likely timing of any payments from the guarantor, the degree to which the guarantor's ability to perform under the guarantee is correlated with the obligor's ability to repay, and the extent to which residual risk to the obligor remains.

Credit derivatives

2.2.63 The minimum requirements for guarantees in this Section shall apply also for single-name credit derivatives. In relation to a mismatch between the underlying obligation and the reference obligation of the credit derivative or the obligation used for determining whether a credit event has occurred the requirements set out under paragraph 2.4.2 of Appendix 2 section III.3 shall apply. For retail exposures and eligible purchased receivables, this paragraph applies to the process of allocating exposures to grades or pools.

2.2.64 The criteria shall address the payout structure of the credit derivative and conservatively assess the impact this has on the level and timing of recoveries. The credit institution shall consider the extent to which other forms of residual risk remain.

Minimum requirements for purchased receivables

Legal certainty

2.2.64 The structure of the facility shall ensure that under all foreseeable circumstances the credit institution has effective ownership and control of all cash remittances from the receivables. When the obligor makes payments directly to a seller or servicer the credit institution shall verify regularly that payments are forwarded completely and within the contractually agreed terms. Servicer shall mean an entity that manages a pool of purchased receivables or the underlying credit exposures on a day-to-day basis. Credit institutions shall have procedures to ensure that ownership over the receivables and cash receipts is protected against bankruptcy stays or legal challenges that could materially delay the lender's ability to liquidate or assign the receivables or retain control over cash receipts.

Effectiveness of monitoring systems

2.2.65 The credit institution shall monitor both the quality of the purchased receivables and the financial condition of the seller and servicer. In particular:

(a) The credit institution shall assess the correlation among the quality of the purchased receivables and the financial condition of both the seller and servicer, and 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.

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

(c) The credit institution shall assess the characteristics of the purchased receivables pools, including over-advances; history of the seller's arrears, bad debts, and bad debt allowances; payment terms, and potential contra accounts.

(d) The credit institution shall have effective policies and procedures for monitoring on an aggregate basis single-obligor concentrations both within and across purchased receivables pools.

(e) The credit institution shall ensure that it receives from the servicer timely and sufficiently detailed reports of receivables ageings and dilutions to ensure compliance with the credit institution's eligibility criteria and advancing policies governing purchased receivables, and provide an effective means with which to monitor and confirm the seller's terms of sale and dilution.

Effectiveness of work-out systems

2.2.66 The credit institution shall have systems and procedures for detecting deteriorations in the seller's financial condition and purchased receivables quality at an early stage, and for addressing emerging problems pro-actively. In particular the credit institution shall have clear and effective policies, procedures, and information systems to monitor covenant violations, and clear and effective policies and procedures for initiating legal actions and dealing with problem purchased receivables.

Effectiveness of systems for controlling collateral, credit availability, and cash

2.2.67 The credit institution shall have clear and effective policies and procedures governing the control of purchased receivables, credit, and cash. In particular, written internal policies shall specify all material elements of the receivables purchase programme, including the advancing rates, eligible collateral, necessary documentation, concentration limits, and the way cash receipts are to be handled. These elements shall take appropriate account of all relevant and material factors, including the seller's and servicer's financial condition, risk concentrations, and trends in the quality of the purchased receivables and the seller's customer base, and internal systems shall ensure that funds are advanced only against specified supporting collateral and documentation.

Compliance with the credit institution's internal policies and procedures

2.2.68 The credit institution shall have an effective internal process for assessing compliance with all internal policies and procedures. The process shall include regular audits of all critical phases of the credit institution's receivables purchase programme, verification of the separation of duties between firstly the assessment of the seller and servicer and the assessment of the obligor and secondly between the assessment of the seller and servicer and the field audit of the seller and servicer, and evaluations of back office operations, with particular focus on qualifications, experience, staffing levels, and supporting automation systems.

3.0.0 VALIDATION OF INTERNAL ESTIMATES

3.1.0 Credit institutions shall have robust systems in place to validate the accuracy and consistency of rating systems, processes, and the estimation of all relevant risk parameters. A credit institution shall demonstrate to its authority that the internal validation process enables it to assess the performance of internal rating and risk estimation systems consistently and meaningfully.

3.2.0 Credit institutions shall regularly compare realised default rates with estimated PDs for each grade and where realised default rates are outside the expected range for that grade credit institutions shall specifically analyse the reasons for the deviation. Credit institutions using own estimates of LGDs or conversion factors shall also perform analogous analysis for these estimates. Such comparisons shall make use of historical data that cover as long a period as possible. The credit institution shall document the methods and data used in such comparisons. This analysis and documentation shall be updated at least annually.

3.3.0 Credit institutions shall also use other quantitative validation tools and comparisons with relevant external data sources. The analysis shall be based on data that are appropriate to the portfolio, are updated regularly, and cover a relevant observation period. Credit institutions' internal assessments of the performance of their rating systems shall be based on as long a period as possible.

3.4.0 The methods and data used for quantitative validation shall be consistent through time. Changes in estimation and validation methods and data (both data sources and periods covered) shall be documented.

3.5.0 Credit institutions shall have sound internal standards for situations where deviations in realised PDs, LGDs, conversion factors and total losses where EL is used from expectations become significant enough to call the validity of the estimates into question. These standards shall take account of business cycles and similar systematic variability in default experience. Where realised values continue to be higher than expected values, credit institutions shall revise estimates upward to reflect their default and loss experience.

4..0.0 CALCULATION OF RISK WEIGHTED EXPOSURE AMOUNTS FOR EQUITY EXPOSURES UNDER THE INTERNAL MODELS APPROACH

4.1.0 Capital requirement and risk quantification

4.1.1 Credit institutions shall meet for the purpose of calculating capital requirements the following standards:

(a) The estimate of potential loss shall be robust to adverse market movements relevant to the long-term risk profile of the credit institution's specific holdings. The data used to represent return distributions shall reflect the longest sample period for which data is available and meaningful in representing the risk profile of the credit institution's specific equity exposures. The data used shall be sufficient to provide conservative, statistically reliable and robust loss estimates that are not based purely on subjective or judgmental considerations. Credit institutions shall demonstrate to authorities that the shock employed provides a conservative estimate of potential losses over a relevant long-term market or business cycle. The credit institution shall 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, credit institutions may use quarterly data or convert shorter horizon period data to a quarterly equivalent using an analytically appropriate method supported by empirical evidence and through a well-developed and documented thought process and analysis. Such an approach shall be applied conservatively and consistently over time. Where only limited relevant data is available the credit institution shall add appropriate margins of conservatism.

(b) The models used shall 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 credit institution’s equity portfolio. The internal models shall 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 shall be closely matched to or at least comparable with those of the credit institution’s equity exposures.

(c) The internal model shall be appropriate for the risk profile and complexity of a credit institution's equity portfolio. Where a credit institution has material holdings with values that are highly non-linear in nature the internal models shall be designed to capture appropriately the risks associated with such instruments.

(d) Mapping of individual positions to proxies, market indices, and risk factors shall be plausible, intuitive, and conceptually sound.

(e) Credit institutions shall demonstrate through empirical analyses the appropriateness of risk factors, including their ability to cover both general and specific risk.

(f) The estimates of the return volatility of equity exposures shall incorporate relevant and available data, information, and methods. Independently reviewed internal data or data from external sources (including pooled data) shall be used.

(g) A rigorous and comprehensive stress-testing programme shall be in place.

4.2.0 Risk management process and controls

4.2.1 With regard to the development and use of internal models for capital requirement purposes, credit institutions shall establish policies, procedures, and controls to ensure the integrity of the model and modelling process. These policies, procedures, and controls shall include the following:

(a) Full integration of the internal model into the overall management information systems of the credit institution and in the management of the banking book equity portfolio. Internal models shall be fully integrated into the credit institution’s risk management infrastructure if they are particularly used in: measuring and assessing equity portfolio performance (including the risk-adjusted performance); allocating economic capital to equity exposures and evaluating overall capital adequacy and 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. These reviews shall 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 by an internal independent unit, or by an independent external third party.

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

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

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

4.3.0 Validation and documentation

4.3.1 Credit institutions shall have a robust system in place to validate the accuracy and consistency of their internal models and modelling processes. All material elements of the internal models and the modelling process and validation shall be documented.

4.3.2 Credit institutions shall use the internal validation process to assess the performance of its internal models and processes in a consistent and meaningful way.

4.3.3 The methods and data used for quantitative validation shall be consistent through time. Changes in estimation and validation methods and data (both data sources and periods covered) shall be documented.

4.3.4 Credit institutions shall regularly compare actual equity returns (computed using realised and unrealised gains and losses) with modelled estimates. Such comparisons shall make use of historical data that is over as long a period as possible. The credit institution shall document the methods and data used in such comparisons. This analysis and documentation shall be updated at least annually.

4.3.5 Credit institutions shall make use of other quantitative validation tools and comparisons with external data sources. The analysis shall be based on data that are appropriate to the portfolio, are updated regularly, and cover a relevant observation period. Credit institutions' internal assessments of the performance of their models shall be based on as long a period as possible.

4.3.6 Credit institutions shall have sound internal standards for situations where comparison of actual equity returns with the models estimates calls the validity of the estimates or of the models as such into question. These standards shall take account of business cycles and similar systematic variability in equity returns. All adjustments made to internal models in response to model reviews shall be documented and consistent with the credit institution's model review standards.

4.3.7 The internal model and the modelling process shall be documented, including the responsibilities of parties involved in the modelling, and the model approval and model review processes.

5.0.0 CORPORATE GOVERNANCE AND OVERSIGHT

5.1.0 Corporate Governance

5.1.1 All material aspects of the rating and estimation processes shall be approved by the credit institution's management body referred to in Article 7(1)(b) of the Act or a designated committee thereof and senior management. These parties shall possess a general understanding of the credit institution's rating systems and detailed comprehension of its associated management reports.

5.1.2 Senior management shall provide notice to the management body referred to in Article 7(1)(b) of the Act or a designated committee thereof of material changes or exceptions from established policies that will materially impact the operations of the credit institution's rating systems.

5.1.3 Senior management shall have a good understanding of the rating systems designs and operations. Senior management shall ensure, on an ongoing basis that the rating systems are operating properly. Senior management shall be regularly informed by the credit risk control units about the performance of the rating process, areas needing improvement, and the status of efforts to improve previously identified deficiencies.

5.1.4 Internal ratings-based analysis of the credit institution's credit risk profile shall be an essential part of the management reporting to these parties. Reporting shall include at least risk profile by grade, migration across grades, estimation of the relevant parameters per grade, and comparison of realised default rates and own estimates of LGDs and conversion factors against expectations and stress-test results. Reporting frequencies shall depend on the significance and type of information and the level of the recipient.

5.2.0 Credit risk control

5.2.1 The credit risk control unit shall be independent from the personal and management functions responsible for originating or renewing exposures and that reports directly to senior management. The unit shall be responsible for the design or selection, implementation, oversight and performance of the rating systems. It shall regularly produce and analyse reports on the output of the rating systems.

5.2.2 The areas of responsibility for the credit risk control unit(s) shall include:

(a) Testing and monitoring grades and pools;

(b) Production and analysis of summary reports from the credit institution's rating systems;

(c) Implementing procedures to verify that grade and pool definitions are consistently applied across departments and geographic areas;

(d) Reviewing and documenting any changes to the rating process, including the reasons for the changes;

(e) Reviewing the rating criteria to evaluate if they remain predictive of risk. Changes to the rating process, criteria or individual rating parameters shall be documented and retained;

(f) Active participation in the design or selection, implementation and validation of models used in the rating process;

(g) Oversight and supervision of models used in the rating process;

(h) Ongoing review and alterations to models used in the rating process.

5.2.3 Notwithstanding paragraph 5.2.2, credit institutions using pooled data according to paragraphs 2.2.9 and 2.2.10 may outsource the following tasks:

(a) Production of information relevant to testing and monitoring grades and pools;

(b) Production of summary reports from the credit institution's rating systems;

(c) Production of information relevant to review of the rating criteria to evaluate if they remain predictive of risk;

(d) Documentation of changes to the rating process, criteria or individual rating parameters;

(e) Production of information relevant to ongoing review and alterations to models used in the rating process.

Credit institutions making use of this paragraph shall ensure that the authorities have access to all relevant information from the third party that is necessary for examining compliance with the minimum requirements and that the authorities may perform on-site examinations to the same extend as within the credit institution.

5.3.0 Internal Audit

5.3.1 Internal audit or another comparable independent auditing unit shall review at least annually the credit institution's rating systems and its operations, including the operations of the credit function and the estimation of PDs, LGDs, ELs and conversion factors. Areas of review shall include adherence to all applicable minimum requirements.