

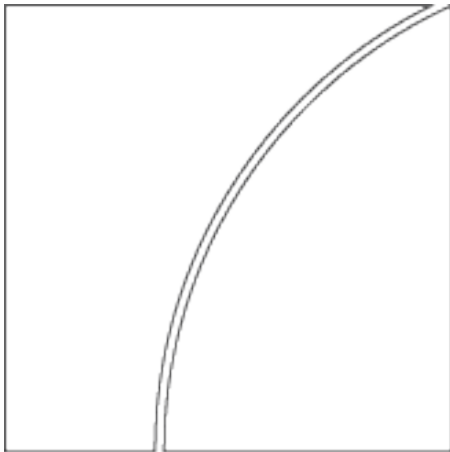
Basel Committee on Banking Supervision

CRE

Calculation of RWA for credit
risk

CRE32

IRB approach: risk
components for each asset
class



**Version effective as of
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First version in the format of the consolidated
framework.



BANK FOR INTERNATIONAL SETTLEMENTS

Introduction

32.1 This chapter presents the calculation of the risk components (PD, LGD, EAD, M) that are used in the formulas set out in [CRE31](#). In calculating these components, the legal certainty standards for recognising credit risk mitigation under the standardised approach to credit risk [CRE22](#) apply for both the foundation and advanced internal ratings-based (IRB) approaches.

Risk components for corporate, sovereign, and bank exposures

32.2 This section, [CRE32.2](#) to [CRE32.50](#), sets out the calculation of the risk components for corporate, sovereign, and bank exposures.

Probability of default (PD)

32.3 For corporate and bank exposures, the PD is the greater of the one-year PD associated with the internal borrower grade to which that exposure is assigned, or 0.03%. For sovereign exposures, the PD is the one-year PD associated with the internal borrower grade to which that exposure is assigned. The PD of borrowers assigned to a default grade(s), consistent with the reference definition of default, is 100%. The minimum requirements for the derivation of the PD estimates associated with each internal borrower grade are outlined in [CRE36.78](#) to [CRE36.80](#).

Loss given default (LGD)

32.4 A bank must provide an estimate of the LGD for each corporate, sovereign and bank exposure. There are two approaches for deriving this estimate: a foundation internal ratings-based (F-IRB) approach and an advanced internal ratings-based (A-IRB) approach.

LGD under the F-IRB approach: treatment of unsecured claims and non-recognised collateral

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

32.6 All subordinated claims on corporates, sovereigns and banks will be assigned a 75% LGD. A subordinated loan is a facility that is expressly subordinated to another facility. At national discretion, supervisors may choose to employ a wider definition of subordination. This might include economic subordination, such as cases where the facility is unsecured and the bulk of the borrower's assets are used to secure other exposures.

LGD under the F-IRB approach: collateral recognition

32.7 In addition to the eligible financial collateral recognised in the standardised approach [CRE22](#), under the F-IRB approach some other forms of collateral, known as eligible IRB collateral, are also recognised. These include receivables, specified commercial and residential real estate, and other collateral, where they meet the minimum requirements set out in [CRE36.127](#) to [CRE36.142](#).¹ For eligible financial collateral, the requirements are identical to the operational standards as set out in the credit risk mitigation chapter of the standardised approach to credit risk [CRE22](#).

Footnotes

¹ *The Committee, however, recognises that, in exceptional circumstances for well-developed and long-established markets, mortgages on office and/or multi-purpose commercial premises and/or multi-tenanted commercial premises may have the potential to receive alternative recognition as collateral in the corporate portfolio. Please refer to the footnote to [CRE20.25](#) for a discussion of the eligibility criteria that would apply. The LGD applied to the collateralised portion of such exposures, subject to the limitations set out in [CRE22.11](#) to [CRE22.76](#) of the standardised approach, will be set at 35%. The LGD applied to the remaining portion of this exposure will be set at 45%. In order to ensure consistency with the capital charges in the standardised approach (while providing a small capital incentive in the IRB approach relative to the standardised approach), supervisors may apply a cap on the capital charge associated with such exposures so as to achieve comparable treatment in both approaches.*

LGD under the F-IRB approach: methodology for recognition of eligible financial collateral

32.8 The methodology for the recognition of eligible financial collateral closely follows that outlined in the comprehensive approach to collateral in the standardised

approach in [CRE22.40](#) to [CRE22.76](#). The simple approach to collateral presented in the standardised approach will not be available to banks applying the IRB approach.

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

- (1) LGD is that of the senior unsecured exposure before recognition of collateral (45%).
- (2) E is the current value of the exposure (i.e. cash lent or securities lent or posted).
- (3) E* is the exposure value after risk mitigation as determined in [CRE22.40](#) to [CRE22.43](#) of the standardised approach. This concept is only used to calculate LGD*. Banks must continue to calculate EAD without taking into account the presence of any collateral, unless otherwise specified.

$$LGD^* = LGD \times (E^* / E)$$

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

32.11 Where repo-style transactions are subject to a master netting agreement, a bank may choose not to recognise the netting effects in calculating capital. Banks that want to recognise the effect of master netting agreements on such for transactions for capital purposes must satisfy the criteria provided in [CRE22.68](#) and [CRE22.69](#) of the standardised approach. The bank must calculate E* in accordance with [CRE22.71](#) and [CRE22.72](#) or [CRE22.73](#) to [CRE22.76](#) and equate this to EAD. The impact of collateral on these transactions may not be reflected through an adjustment to LGD.

32.12 As in the standardised approach, for transactions where the conditions in [CRE22.65](#) are met, and in addition, the counterparty is a core market participant as specified in [CRE22.66](#), supervisors may choose not to apply the haircuts specified under the comprehensive approach, but instead to apply a zero H.

LGD under the F-IRB approach: methodology for recognition of eligible IRB collateral

32.13

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

- (1) Exposures where the minimum eligibility requirements are met, but the ratio of the current value of the collateral received (C) to the current value of the exposure (E) is below a threshold level of C^* (ie the required minimum collateralisation level for the exposure) would receive the appropriate LGD for unsecured exposures or those secured by collateral which is not eligible financial collateral or eligible IRB collateral.
- (2) Exposures where the ratio of C to E exceeds a second, higher threshold level of C^{**} (ie the required level of over-collateralisation for full LGD recognition) would be assigned an LGD according to the following table.

32.14 The following table displays the applicable LGD and required over-collateralisation levels for the secured parts of senior exposures, where:

- (1) Senior exposures are to be divided into fully collateralised and uncollateralised portions.
- (2) The part of the exposure considered to be fully collateralised, C/C^{**} , receives the LGD associated with the type of collateral.
- (3) The remaining part of the exposure is regarded as unsecured and receives an LGD of 45%.

- (4) Other collateral excludes physical assets acquired by the bank as a result of a loan default.

	Minimum LGD	Required minimum collateralisation level of the exposure (C*)	Required level of over-collateralisation for full LGD recognition (C**)
Eligible Financial collateral	0%	0%	n.a.
Receivables	35%	0%	125%
Commercial or residential real estate	35%	30%	140%
Other collateral	40%	30%	140%

Minimum LGD for secured portion of senior exposures

LGD under the F-IRB approach: methodology for the treatment of pools of collateral

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

- (1) In the case where a bank has obtained multiple forms of credit risk mitigation (CRM), it will be required to subdivide the adjusted value of the exposure (after the haircut for eligible financial collateral) into portions each covered by only one CRM type. That is, the bank must divide the exposure into the portion covered by eligible financial collateral, the portion covered by receivables, the portion covered by commercial or residential real estate collateral, a portion covered by other collateral, and an unsecured portion, where relevant.

- (2) Where the ratio of the sum of the value of commercial or residential real estate and other collateral to the reduced exposure (after recognising the effect of eligible financial collateral and receivables collateral) is below the associated threshold level (i.e. the minimum degree of collateralisation of the exposure), the exposure would receive the appropriate unsecured LGD value of 45%.
- (3) The risk-weighted assets for each fully secured portion of exposure must be calculated separately.

LGD under the advanced approach

32.16 Subject to certain additional minimum requirements specified below, supervisors may permit banks to use their own internal estimates of LGD for corporate, sovereign and bank exposures. LGD must be measured as the loss given default as a percentage of the EAD. Banks eligible for the IRB approach that are unable to meet these additional minimum requirements must utilise the foundation LGD treatment described above.

32.17 The minimum requirements for the derivation of LGD estimates are outlined in [CRE36.85](#) to [CRE36.90](#).

Treatment of certain repo-style transactions

32.18 Banks that want to recognise the effects of master netting agreements on repo-style transactions for capital purposes must apply the methodology outlined in [CRE32.11](#) for determining E* for use as the EAD. For banks using the advanced approach, own LGD estimates would be permitted for the unsecured equivalent amount (E*).

Treatment of guarantees and credit derivatives

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

32.20 Under either approach, CRM in the form of guarantees and credit derivatives must not reflect the effect of double default (see [CRE36.100](#)). As such, to the extent that the CRM is recognised by the bank, the adjusted risk weight will not be less than that of a comparable direct exposure to the protection provider. Consistent with the standardised approach, banks may choose not to recognise credit protection if doing so would result in a higher capital requirement.

Treatment of guarantees and credit derivatives: recognition under the foundation approach

32.21 For banks using the foundation approach for LGD, the approach to guarantees and credit derivatives closely follows the treatment under the standardised approach as specified in [CRE22.84](#) to [CRE22.96](#). The range of eligible guarantors is the same as under the standardised approach except that companies that are internally rated may also be recognised under the foundation approach. To receive recognition, the requirements outlined in [CRE22.84](#) to [CRE22.89](#) must be met.

32.22 Eligible guarantees from eligible guarantors will be recognised as follows:

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

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

32.24 Where partial coverage exists, or where there is a currency mismatch between the underlying obligation and the credit protection, it is necessary to split the exposure into a covered and an uncovered amount. The treatment in the foundation approach follows that outlined in the standardised approach in [CRE22.92](#) to [CRE22.95](#), and depends upon whether the cover is proportional or tranching.

Treatment of guarantees and credit derivatives: recognition under the advanced approach

32.25

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

32.26 A bank relying on own-estimates of LGD has the option to adopt the treatment outlined above for banks under the F-IRB approach [CRE32.21](#) to [CRE32.24](#), or to make an adjustment to its LGD estimate of the exposure to reflect the presence of the guarantee or credit derivative. Under this option, there are no limits to the range of eligible guarantors although the set of minimum requirements provided in [CRE36.101](#) to [CRE36.102](#) concerning the type of guarantee must be satisfied. For credit derivatives, the requirements of [CRE36.106](#) to [CRE36.107](#) must be satisfied. When credit derivatives do not cover the restructuring of the underlying obligation, the partial recognition set out in [CRE22.87](#) applies.

Operational requirements for recognition of double default

32.27 A bank using an IRB approach has the option of using the substitution approach in determining the appropriate capital requirement for an exposure. However, for exposures hedged by one of the following instruments the double default framework according to [CRE31.14](#) to [CRE31.17](#) may be applied subject to the additional operational requirements set out in [CRE32.28](#). A bank may decide separately for each eligible exposure to apply either the double default framework or the substitution approach.

- (1) Single-name, unfunded credit derivatives (eg credit default swaps) or single-name guarantees.
- (2) First-to-default basket products — the double default treatment will be applied to the asset within the basket with the lowest risk-weighted amount.
- (3) n^{th} -to-default basket products — the protection obtained is only eligible for consideration under the double default framework if eligible $(n-1)^{\text{th}}$ default protection has also been obtained or where $(n-1)$ of the assets within the basket have already defaulted.

32.28 The double default framework is only applicable where the following conditions are met:

- (1) The risk weight that is associated with the exposure prior to the application of the framework does not already factor in any aspect of the credit protection.
- (2) The entity selling credit protection is a bank², investment firm or insurance company (but only those that are in the business of providing credit protection, including mono-lines, re-insurers, and non-sovereign credit export agencies³), referred to as a financial firm, that:
 - (a) is regulated in a manner broadly equivalent to that in this Framework (where there is appropriate supervisory oversight and transparency /market discipline), or externally rated as at least investment grade by a credit rating agency deemed suitable for this purpose by supervisors;
 - (b) had an internal rating with a PD equivalent to or lower than that associated with an external A- rating at the time the credit protection for an exposure was first provided or for any period of time thereafter; and
 - (c) has an internal rating with a PD equivalent to or lower than that associated with an external investment-grade rating.
- (3) The underlying obligation is:
 - (a) a corporate exposure as defined in [CRE30.6](#) to [CRE30.16](#) (excluding specialised lending exposures for which the supervisory slotting criteria approach described in [CRE33.2](#) to [CRE33.7](#) is being used); or
 - (b) a claim on a public sector entity (PSE) that is not a sovereign exposure as defined in [CRE30.17](#); or
 - (c) a loan extended to a small business and classified as a retail exposure as defined in [CRE30.21](#)(2).
- (4) The underlying obligor is not:
 - (a) a financial firm as defined in (2); or
 - (b) a member of the same group as the protection provider.
- (5) The credit protection meets the minimum operational requirements for such instruments as outlined in [CRE22.84](#) to [CRE22.88](#).

- (6) In keeping with [CRE22.85](#) for guarantees, for any recognition of double default effects for both guarantees and credit derivatives a bank must have the right and expectation to receive payment from the credit protection provider without having to take legal action in order to pursue the counterparty for payment. To the extent possible, a bank should take steps to satisfy itself that the protection provider is willing to pay promptly if a credit event should occur.
- (7) The purchased credit protection absorbs all credit losses incurred on the hedged portion of an exposure that arise due to the credit events outlined in the contract.
- (8) If the payout structure provides for physical settlement, then there must be legal certainty with respect to the deliverability of a loan, bond, or contingent liability. If a bank intends to deliver an obligation other than the underlying exposure, it must ensure that the deliverable obligation is sufficiently liquid so that the bank would have the ability to purchase it for delivery in accordance with the contract.
- (9) The terms and conditions of credit protection arrangements must be legally confirmed in writing by both the credit protection provider and the bank.
- (10) In the case of protection against dilution risk, the seller of purchased receivables must not be a member of the same group as the protection provider.
- (11) There is no excessive correlation between the creditworthiness of a protection provider and the obligor of the underlying exposure due to their performance being dependent on common factors beyond the systematic risk factor. The bank has a process to detect such excessive correlation. An example of a situation in which such excessive correlation would arise is when a protection provider guarantees the debt of a supplier of goods or services and the supplier derives a high proportion of its income or revenue from the protection provider.

Footnotes

² *This does not include PSEs and multilateral development banks, even though claims on these may be treated as claims on banks according to [CRE30.18](#).*

³ *By non-sovereign it is meant that credit protection in question does not benefit from any explicit sovereign counter-guarantee.*

Exposure at default (EAD)

32.29 The following sections apply to both on and off-balance sheet positions. All exposures are measured gross of specific provisions or partial write-offs. The EAD on drawn amounts should not be less than the sum of (i) the amount by which a bank's regulatory capital would be reduced if the exposure were written-off fully, and (ii) any specific provisions and partial write-offs. When the difference between the instrument's EAD and the sum of (i) and (ii) is positive, this amount is termed a discount. The calculation of risk-weighted assets is independent of any discounts. Under the limited circumstances described in [CRE35.4](#), discounts may be included in the measurement of total eligible provisions for purposes of the EL-provision calculation set out in [CRE35](#).

Exposure measurement for on-balance sheet items

32.30 On-balance sheet netting of loans and deposits will be recognised subject to the same conditions as under the standardised approach (see [CRE22.82](#) to [CRE22.83](#)). Where currency or maturity mismatched on-balance sheet netting exists, the treatment follows the standardised approach, as set out in [CRE22.94](#), [CRE22.95](#) and [CRE22.97](#) to [CRE22.100](#).

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

32.31 For off-balance sheet items, exposure is calculated as the committed but undrawn amount multiplied by a credit conversion factor (CCF). There are two approaches for the estimation of CCFs: a foundation approach and an advanced approach. When only the drawn balances of revolving facilities have been securitised, banks must ensure that they continue to hold required capital against the undrawn balances associated with the securitised exposures.

EAD under the foundation approach

32.32 The types of instruments and the CCFs applied to them are the same as those in the standardised approach, as outlined in [CRE20.35](#) to [CRE20.45](#) with the exception of commitments, Note Issuance Facilities (NIFs) and Revolving Underwriting Facilities (RUFs).

- 32.33** A CCF of 75% will be applied to commitments, NIFs and RUFs regardless of the maturity of the underlying facility. This does not apply to those facilities which are uncommitted, that are unconditionally cancellable, or that effectively provide for automatic cancellation, for example due to deterioration in a borrower's creditworthiness, at any time by the bank without prior notice. A CCF of 0% will be applied to these facilities.
- 32.34** The amount to which the CCF is applied is the lower of the value of the unused committed credit line, and the value that reflects any possible constraining availability of the facility, such as the existence of a ceiling on the potential lending amount which is related to a borrower's reported cash flow. If the facility is constrained in this way, the bank must have sufficient line monitoring and management procedures to support this contention.
- 32.35** In order to apply a 0% CCF for unconditionally and immediately cancellable corporate overdrafts and other facilities, banks must demonstrate that they actively monitor the financial condition of the borrower, and that their internal control systems are such that they could cancel the facility upon evidence of a deterioration in the credit quality of the borrower.
- 32.36** Where a commitment is obtained on another off-balance sheet exposure, banks under the foundation approach are to apply the lower of the applicable CCFs.

EAD under the advanced approach

- 32.37** Banks which meet the minimum requirements for use of their own estimates of EAD (see [CRE36.91](#) to [CRE36.96](#)) will be allowed to use their own internal estimates of CCFs across different product types provided the exposure is not subject to a CCF of 100% in the foundation approach (see [CRE32.32](#)).

Exposures that give rise to counterparty credit risk

- 32.38** For exposures that give rise to counterparty credit risk according to [CRE51.4](#) (ie over-the-counter, or OTC, derivatives, exchange-traded derivatives, long settlement transactions and securities financing transactions), the EAD is to be calculated under the rules set forth in [CRE50](#) to [CRE54](#).

Effective maturity (M)

32.39 For banks using the foundation approach for corporate exposures, effective maturity (M) will be 2.5 years except for repo-style transactions where the

effective maturity will be 6 months. National supervisors may choose to require all banks in their jurisdiction (those using the foundation and advanced approaches) to measure M for each facility using the definition provided below.

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

32.41 Except as noted in [CRE32.45](#), M is defined as the greater of one year and the remaining effective maturity in years as defined below. In all cases, M will be no greater than 5 years.

32.42 For an instrument subject to a determined cash flow schedule, effective maturity M is defined as follows, where CF_t denotes the cash flows (principal, interest payments and fees) contractually payable by the borrower in period t:

$$\text{Effective maturity} = M = \frac{\sum_t t \cdot CF_t}{\sum_t CF_t}$$

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

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

32.45 The one-year floor does not apply to certain short-term exposures, comprising fully or nearly-fully collateralised⁴ capital market-driven transactions (ie OTC derivatives transactions and margin lending) and repo-style transactions (ie repos /reverse repos and securities lending/borrowing) with an original maturity of less than one year, where the documentation contains daily remargining clauses. For all eligible transactions the documentation must require daily revaluation, and must include provisions that must allow for the prompt liquidation or setoff of the collateral in the event of default or failure to re-margin. The maturity of such transactions must be calculated as the greater of one-day, and the effective maturity (M, consistent with the definition above).

Footnotes

⁴ *The intention is to include both parties of a transaction meeting these conditions where neither of the parties is systematically under-collateralised.*

32.46 The one-year floor also does not apply to the following exposures:

- (1) Short-term self-liquidating trade transactions. Import and export letters of credit and similar transactions should be accounted for at their actual remaining maturity.
- (2) Issued as well as confirmed letters of credit that are short term (ie have a maturity below one year) and self-liquidating.

32.47 In addition to the transactions considered in [CRE32.45](#) above, other short-term exposures with an original maturity of less than one year that are not part of a bank's ongoing financing of an obligor may be eligible for exemption from the one-year floor. After a careful review of the particular circumstances in their jurisdictions, national supervisors should define the types of short-term exposures that might be considered eligible for this treatment. The results of these reviews might, for example, include transactions such as:

- (1) Some capital market-driven transactions and repo-style transactions that might not fall within the scope of [CRE32.45](#);
- (2) Some trade finance transactions that are not exempted by [CRE32.46](#).
- (3) Some exposures arising from settling securities purchases and sales. This could also include overdrafts arising from failed securities settlements provided that such overdrafts do not continue more than a short, fixed number of business days;

- (4) Some exposures arising from cash settlements by wire transfer, including overdrafts arising from failed transfers provided that such overdrafts do not continue more than a short, fixed number of business days;
- (5) Some exposures to banks arising from foreign exchange settlements; and
- (6) Some short-term loans and deposits.

32.48 For transactions falling within the scope of [CRE32.45](#) subject to a master netting agreement, the weighted average maturity of the transactions should be used when applying the explicit maturity adjustment. A floor equal to the minimum holding period for the transaction type set out in [CRE22.61](#) will apply to the average. Where more than one transaction type is contained in the master netting agreement a floor equal to the highest holding period will apply to the average. Further, the notional amount of each transaction should be used for weighting maturity.

32.49 Where there is no explicit adjustment, the effective maturity (M) assigned to all exposures is set at 2.5 years unless otherwise specified in [CRE32.39](#).

Treatment of maturity mismatches

32.50 The treatment of maturity mismatches under IRB is identical to that in the standardised approach (see [CRE22.97](#) to [CRE22.100](#)).

Risk components for retail exposures

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

32.51 For each identified pool of retail exposures, banks are expected to provide an estimate of the PD and LGD associated with the pool, subject to the minimum requirements as set out in [CRE36](#). Additionally, the PD for retail exposures is the greater of the one-year PD associated with the internal borrower grade to which the pool of retail exposures is assigned or 0.03%.

32.52 LGDs for retail exposures secured by residential properties cannot be set below 10% for any sub-segment of exposures to which the formula in [CRE31.19](#) is applied. The 10% LGD floor shall not apply, however, to sub-segments that are subject to/benefit from sovereign guarantees. Further, the existence of the floor does not imply any waiver of the requirements of LGD estimation as laid out in the minimum requirements starting with [CRE36.85](#).

Recognition of guarantees and credit derivatives

- 32.53** Banks may reflect the risk-reducing effects of guarantees and credit derivatives, either in support of an individual obligation or a pool of exposures, through an adjustment of either the PD or LGD estimate, subject to the minimum requirements in [CRE36.98](#) to [CRE36.107](#). Whether adjustments are done through PD or LGD, they must be done in a consistent manner for a given guarantee or credit derivative type.
- 32.54** Consistent with the requirements outlined above for corporate, sovereign, and bank exposures, banks must not include the effect of double default in such adjustments. The adjusted risk weight must not be less than that of a comparable direct exposure to the protection provider. Consistent with the standardised approach, banks may choose not to recognise credit protection if doing so would result in a higher capital requirement.

Exposure at default (EAD)

- 32.55** Both on and off-balance sheet retail exposures are measured gross of specific provisions or partial write-offs. The EAD on drawn amounts should not be less than the sum of (i) the amount by which a bank's regulatory capital would be reduced if the exposure were written-off fully, and (ii) any specific provisions and partial write-offs. When the difference between the instrument's EAD and the sum of (i) and (ii) is positive, this amount is termed a discount. The calculation of risk-weighted assets is independent of any discounts. Under the limited circumstances described in [CRE35.4](#), discounts may be included in the measurement of total eligible provisions for purposes of the EL-provision calculation set out in [CRE35](#).
- 32.56** On-balance sheet netting of loans and deposits of a bank to or from a retail customer will be permitted subject to the same conditions outlined in [CRE22.82](#) and [CRE22.83](#) of the standardised approach. For retail off-balance sheet items, banks must use their own estimates of CCFs provided the minimum requirements in [CRE36.91](#) to [CRE36.94](#) and [CRE36.97](#) are satisfied.
- 32.57** For retail exposures with uncertain future drawdown such as credit cards, banks must take into account their history and/or expectation of additional drawings prior to default in their overall calibration of loss estimates. In particular, where a bank does not reflect conversion factors for undrawn lines in its EAD estimates, it must reflect in its LGD estimates the likelihood of additional drawings prior to default. Conversely, if the bank does not incorporate the possibility of additional drawings in its LGD estimates, it must do so in its EAD estimates.

32.58 When only the drawn balances of revolving retail facilities have been securitised, banks must ensure that they continue to hold required capital against the undrawn balances associated with securitised exposures using the IRB approach to credit risk for commitments.

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

Risk components for equity exposures

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

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