



# ECB GUIDE TO INTERNAL MODELS

GENERAL TOPICS AND CREDIT RISK CHAPTERS - UPDATE JUNE 2023

PART 2 OF 2

JULY, 2023

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**TRUE NORTH PARTNERS**  
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# Outline

- 1 Overview of the main updates
- 2 Credit Risk chapter
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# Overview of the main updates

This paper is our second in a series of two papers covering the June 2023 update of the ECB Guide to Internal Models

In this paper we outline our interpretation of the main changes made to the **Credit Risk** chapter

The previous post of this series, related to the relevant updates on the **General Topics** chapter, can be found on our [website](#)

# Overview of the main updates & changes\* in the ECB Guide to internal models

## June 2023 update

### General topics chapter | Updated/Incorporated sections

Covered in  
paper 1



Integration of **ESG risk assessment for internal modelling** of credit risk, market risk and counterparty credit risk



Expectations on the **implementation date** of any material change or extension of a model



Guidance on **reversion to less sophisticated approaches** for own funds calculations (i.e., standardised approach)



ECB clarifications and expectations on the use of internal models in the context of a **consolidation process**



Clarifications on **use test requirements**

### Credit Risk chapter | Updated/Incorporated sections

Covered  
in this paper



#### Definition of Default (DoD)

- Consistency in the application
- Days past due criterion
- UTP criterion
- Return to non-default status
- Consistency of external data
- Treatment of Joint Credit obligations
- Adjustments of estimates in case of changes in the definition



#### Probability of Default (PD)

- Model monitoring
- Clarification on the requirements for rating transfers
- Calculation of one-year default rates
- PD calibration
- ESG considerations



#### Loss Given Default (LGD)

- Realised LGD
- Treatment of massive disposals
- LGD structure (segmentation and ELBE)
- ESG considerations



#### Credit Conversion Factor (CCF)

- CCF assignment based on judgmental considerations



#### Margin of Conservatism (MoC)

- Considerations on MoC type C
- ESG considerations



#### IT systems and Use of data

- Model implementation readiness at the time of the application
- Use of data in the context of entity consolidation

(\* There have also been updates and changes in the Market Risk and Counterparty Credit Risk chapters, not covered by this document. Additionally, the new guidelines include minor wording changes and regulatory reference updates.



# Credit risk chapter



IT implementation  
and use of data



Definition of Default



Probability of Default  
estimation  
-PD-

Our interpretation of the ECB **updates** to...



Loss Given Default  
estimation  
-LGD-



Credit Conversion  
Factor estimation  
-CCF-



Margin of  
Conservatism  
-MoC-





## IT implementation and use of data

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# ECB Guide to internal models - June 2023 Update

## Credit risk chapter: IT implementation and use of data



### IT implementation of a new model or model change

Section 2.2 | Articles 7 to 8

- When applying for an initial model approval or for roll-out of the IRB approach, the institution should provide evidence that it has implemented the proposed model into a live or, if duly justified, non-live production environment. In particular, this means that the entity:
  - a) is able to produce risk parameter estimates for exposures in the scope of application;
  - b) has successfully completed IT user acceptance tests;
  - c) is able to calculate the own funds requirements resulting from its risk parameters estimates under the IRB approach;
  - d) is able to submit the respective COREP reporting;
  - e) is able to use the model for internal risk measurement and management purposes; and
  - f) is ready to introduce a reporting system based on the risk parameters produced by the model.
- When requesting a material change to a model, the entity shall demonstrate that it is able to provide a new version of the relevant IT systems to go into production upon approval of the changes. It should also be able to fully replicate the execution of the model and the calculation of own funds requirements according to the model change in a non-live production environment, fulfilling the points set out above.



### Use of data in the context of entity consolidation

Section 3.7 | Articles 54 to 57

- In the case of mergers and acquisitions, the ECB understands that the combined default and loss data histories of the acquiring and acquired entities should be used to calibrate IRB models.
- Where the acquirer does not automatically have the legal right to access the default and loss histories of the acquired portfolios (e.g., in the case of a portfolio acquisition), the acquirer shall nevertheless make reasonable efforts to have access to all the data.
- In cases where default and loss histories are limited in scope, duration or quality, and where it cannot be demonstrated that this situation does not give rise to bias, this should be considered a data deficiency and an appropriate MoC should be applied accordingly.





## Definition of Default

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# ECB Guide to internal models - June 2023 Update

## Credit Risk topics: Definition of Default



A new section has been introduced to cover the **definition of default**. It incorporates the ECB's expectation of the relevant provisions aimed to ensure a **common and consistent approach** to the application of the **definition of default** according to current regulations.



### Consistency of the application

Section 4.2 | Articles 60 to 64

#### Identification of common obligors across legal entities and geographies:

- When the entity finds it burdensome and deems the impact to be immaterial, the ECB expects as best practice to perform a regular monitoring process of those exposures with the following considerations:
  - Assumptions for the identification of common obligors should be clearly stated;
  - Thresholds in terms of number of clients and exposure;
  - Actions if the thresholds are breached; and
  - Frequency of monitoring proportional to the share of common obligors in terms of number and exposure but no less than annual.

#### Obligors with exposures in jurisdictions with different materiality thresholds:

- The default will be triggered in the jurisdiction where the materiality is first exceeded for the 90 consecutive days and will apply Unlikelihood to pay (UTP) triggers to have a consistent default status across jurisdictions.

#### Joint Credit Obligations:

- It is the ECB's expectation that the Joint Credit Obligations treatment regarding Definition of Default (DoD) applies not only for retail exposures but also for non-retail exposures.
- The default of a joint obligor is considered separately from the default of individual obligors in the default time series. The default of a joint obligor could be considered as a UTP for individual obligors.

# ECB Guide to internal models - June 2023 Update

## Credit Risk topics: Definition of Default



### Days past due criterion

Section 4.3 | Articles 65 to 76

- Cases with a **considerable number of missed payments before breaching materiality thresholds** (Bullet loans) should be considered as **UTP indicators**.
- **No application of proxies is allowed (e.g. 3 missed monthly payments).**
- **Inconsistency between past due at obligor and facility level:**
  - The count of days at obligor level has prevalence over facility level.
  - Exception for factoring arrangements with all the facilities being less than 30 days past due.
- Past due amounts not material: the counting of days is reset.
- Reasons for the reduction in material payments: repayments from obligor or changes in classification from retail to non-retail.
- **Absolute component in Euro:** the exposure should be converted to euro every day with the daily exchange rate.
- **Inclusion of maintenance fees** of deposit accounts but not including **write-offs**.
- The **calculation** of days past due can be performed less often than daily but it should then cover each day from the last calculation performed.
- **Lower materiality threshold as UTP indicator** - monitor it together with the day past due criterion.



### Unlikeness to pay criterion (UTP)

Section 4.4 | Articles 77 to 82

Sale of credit obligations: no change with respect to the guidelines.

- Conditions to be considered a default: 1. the reason of sale is credit related , 2. the ratio of economic loss is above 5%.
- Securitisation with significant risk transfer are also considered as a UTP.

Distressed restructuring:

- Effective interest rate to discount cashflows: original effective interest rate on the old and new arrangement.
- Late fees or interest rates penalties.
  - NPV0: Not included in any case.
  - NPV1: Included in the case that they are not forgiven.

Additional UTP indicators: not prudent to consider only those mentioned in article 178(3) of the CRR. Should also consider the list in paragraph 59 of the EBA Guidelines on DoD.

# ECB Guide to internal models - June 2023 Update

## Credit Risk topics: Definition of Default



### Return to non-defaulted status

Section 4.5 | Articles 83 to 86

**Definition of Default at obligor level:** monitor the conditions to each exposure of the obligor and may return when all conditions are met for all exposures.

**Definition of Default at facility level:** in the case that an obligor has multiple default facilities, the probation period could be aligned between exposures.

**Definition of material payment:** subject to monitoring in the analysis of the effectiveness of the policy for returning to non-default status.

#### **Past due amounts:**

- **Non distressed restructuring exposure:** non material exposure or material with less than 90 consecutive dates past due.
- **Distressed restructuring exposure:** no past due amounts event if they are immaterial or less than 90 days past due. It is also necessary to make a material payment before leaving default status.

#### **Activation of new default triggers for distressed restructuring:**

- If it **does not apply to a defaulted exposure**, when a new default trigger becomes applicable while the probation period is running, then the probation period is reset to zero and will start again when all default triggers, including the new one, will again cease to apply.
- If it applies to a **defaulted exposure**, the probation period should last a minimum of one year from the latest of a list of events (moment when the restructuring measures were extended; moment when the exposure was classified as defaulted; or the end of the grace period included in the restructuring arrangements). If a new default trigger becomes applicable while the probation period is running, then the probation period keeps running but the exposure still cannot return to non-defaulted status until the new trigger and all other triggers cease to apply.



### Consistency of external data

Section 4.6 | Articles 87 to 88

#### **Representativeness of external default data:**

- Difference negligible in terms of risk parameters and own funds: use the default definition without any adjustment.
- Otherwise apply an appropriate adjustment on granular data or at a more aggregated level.

**Margin of Conservatism Type A:** apply a MoC A for the higher level of uncertainty in the estimation.

# ECB Guide to internal models - June 2023 Update

## Credit Risk topics: Definition of Default



### Adjustments to risk estimates in the case of changes to the definition of default

Section 4.7 | Articles 89 to 93

Consideration of change in the default definition: counting of past due, changes in the indicator of UTP or in the criteria for the return to non-default status.

Assess the impact on risk differentiation: where the model does not perform well ECB recommends to perform a full redevelopment of models.

Comparison of the default definition: in the historical period used in the risk quantification.

- An appropriate dataset reflecting the new definition of default should be considered.
  - Institutions **can adjust historical granular data collected on the basis of the old definition of default** in order to achieve broad equivalence to the new definition, by means of a parallel run, a retrospective or a similar classification of data according to the new definition.
  - **If the adjustments to the data do not cover the full historic period:** apply correction factors (at least two years of data) to the historic data where there is no information.

Margin of Conservatism:

- Quantification of MoC is necessary even if the impact of the new definition is minimal.
- In the case where there are appropriate adjustments, it is necessary to quantify a MoC to cover the uncertainty of that adjustment.



## Probability of Default estimation - $\hat{PD}$ -

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# ECB Guide to internal models - June 2023 Update

## Credit Risk topics: Probability of Default (PD)



Several updates have been introduced in the section for **Probability of Default**. The most relevant updates are related to the **calculation of the one-year default rates and the PD calibration**.



### Calculation of one-year default rates

Section 4.2.2 | Articles 122 to 126

**Joint obligors:** Should be counted separately from the default of individual obligors. Consequently, a specific rating/PD should be assigned to the joint obligor and should be counted separately for the default rate and RWA calculation.

Include the **obligors and facilities that cease to exist during one-year observation period**. ECB understands that this is not an issue in the calculation of the one-year default rate per se, and therefore no appropriate adjustment or deviation from the one-year default rate calculation method applies on the basis of their mere existence. There may be the necessity of appropriate adjustments e.g. due to sold obligations or migrations if specific biases are identified (but only then).

**Migrations to different rating models or rating systems during the one-year observation period:** The default cases (and non-defaulted) are counted in the calculation of the one year default rate. In the event of any deficiency, the corresponding MoC must be calculated.

**Gives more detail in the analysis of the potential bias from the sale of credit obligations:** Analyse if the sales deviate materially from those observed in other periods, if so, quantify a MoC due to the increased uncertainty in the estimation.

#### **Use of external data in the PD estimation:**

- Analyse potential biases in the estimation: compare the LRA default rate using only internal data to the average PD estimates. The results are biased if any of the following conditions are met:
  1. At calibration segment level there are material differences between the average of the two previous elements of comparison.
  2. At grade level there are systematic differences (i.e., the direction of the differences is not random).
- Avoid drawing the conclusion that there is no material/systematic difference just because differences are statistically insignificant, in particular where data is scarce (and confidence intervals are wide)



### Clarification on the requirements for rating transfers (use of a third-party rating)

Section 5.1.4 | Articles 108 to 111

- The condition to be classified as rating transfer is the presence of an appropriate guarantee or organisation relationship between obligor and a third party.
- **Definition of appropriate guarantee:** provides the obligor with a claim against the third party that is effective (i.e., it prevents the default) and enforceable (from a legal perspective) before the institution has to recognise a default event of the obligor.

# ECB Guide to internal models - June 2023 Update

## Credit Risk topics: Probability of Default (PD)



### PD calibration

Section 4.2.2 | Articles 127 to 137

#### Requirements in the selection of the calibration approach:

- The observed one year default rates should cover the full period representative of the likely range of variability of default rates.
- Change in scoring or rating method: recalculate the new assignment back through time in order to cover the period of the likely range of variability. Where this recalculation is not possible it should be justified and documented.
- When the historical period is not representative of the likely range of variability: Apply an adjustment to the observed average of one-year default rates if there is correlation with an economic indicator. The calculation of the adjustment at grade level also depends on the grade assignment dynamics. Computation of a MoC for the uncertainty in the estimation of the adjustments (the higher the uncertainty, the higher the MoC).

#### Calibration at grade level:

- The PD of each grade should be equal to the LRA default rate of each grade or pool.
- Additional tests: Compare the LRA PD at calibration segment level with the LRA default rate at calibration segment.
- Calculation of LRA PD at calibration segment: arithmetic average across time of the arithmetic average PD at calibration segment level for each reference date.

#### Calibration at segment level:

- Description of possible situations where the LRA default rate and average PD at grade level could differ:
  - The calibration sample is not representative of the likely variability of the default rates.
  - The discriminatory power of the calibration sample differs to the discriminatory power of the full period of the LRA default rate.
  - Justify the differences and the choices in methodology.
- Perform additional calibration testing in the development and in the monitoring of models (post calibration):
  - Check that there are no systematic deviations between the estimated PDs and the LRA default rate at grade level.
  - Analyse the direction of the divergences (look at consecutive grades).
  - Calculate the impact in terms of RWA in the application portfolio differences between default rate and PD at grade level, even if these differences are not systematic.

Overrides in PD calibration: whenever it is not possible to use overrides apply an appropriate adjustment with a corresponding MoC. In order to assess the impact use representative sample from a recent date. Take into account overrides in the calibration to the LRA default rate.





## Loss Given Default estimation -LGD-

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# ECB Guide to internal models - June 2023 Update

## Credit Risk topics: Loss Given Default (LGD)



The most relevant updates are related to the ECB's expectation in relation to article 500 of the CRR (provisions on massive disposals) and clarifications regarding LGD structure, LGD segmentation and the Expected Loss Best Estimate (ELBE).



### Calculation of realised LGD

Section 5.1.3 | Article 99

Information at aggregated level rather than at facility level: the ECB expects institutions to duly justify and document the underlying reasons for the collection and storage at a more aggregated level than facility level.



### Treatment of massive disposals | Article 500 of the CRR (1/2)

Section 6.1.5 | Articles 155 to 169

Adjust their LGD estimates “by partly or fully offsetting the effect of massive disposals of defaulted exposures on realised LGDs up to the difference between the average estimated LGDs for comparable exposures in default that have not been finally liquidated and the average realised LGDs including on the basis of the losses realised due to massive disposals”, subject to certain conditions.

#### Applicability of the adjustment:

- Disposals made from 23/11/2016 to 28/06/2022. The date of the disposal is the date of transfer of legal ownership of the assets.
- The disposal accounts for at least 20% of defaulted exposure of the entity.
  - **Numerator:** cumulative amount of defaulted exposures disposed of since the first date for disposals. Foreclosed assets are not considered massive disposals
  - **Denominator:** total amount of defaulted exposure outstanding at entity level as at the date of first disposal.

# ECB Guide to internal models - June 2023 Update

## Credit Risk topics: Loss Given Default (LGD)

### Treatment of massive disposals | Article 500 of the CRR (2/2)

Section 6.1.5 | Articles 155 to 169

#### How to compute the average LGD for comparable exposures in default that have not been liquidated?

- Apply the incomplete workout treatment at the date before the disposal. The data used to develop the incomplete workout treatment should be representative of the portfolio of the disposed assets (in line with sections 4.2.2 to 4.2.4 of the Guidelines on PD and LGD). If there are issues in representativeness, a MoC should be quantified.
- Keep the adjusted LGD constant after the disposal date.

#### RDS requirements:

- Should store:
  - Realised LGD,
  - Adjusted LGD, and
  - The actual sale of the assets.

#### Impact of the article 500:

- **Calculation of maximum recovery period:** these exposures are considered closed on the disposal date and should be used in the determination of the maximum period of recovery.
- Calculation of **realised LGD and LRA LGD**.
- **Downturn period identification and quantification:** should be done after the application of article 500 adjustment.
- **ELBE and LGD in default:** the disposal cashflow will be adjusted.
- **Analysis of reference date:** default subject to massive disposal should be removed for the purpose of the identification of reference dates.

# ECB Guide to internal models - June 2023 Update

## Credit Risk topics: Loss Given Default (LGD)




### LGD structure

Section 6.2 | Articles 170 to 177

**Definition of grade/pool:** subset of facilities to which the same LGD is applied for the calculation of regulatory capital requirement.

#### LGD segmentation:

- **Analyse the risk drivers one year before the default:**
  - The choice of reference date of the risk driver should ensure consistency with the expected distribution of risk drivers of defaults over one-year horizon.
  - Where risk drivers vary over time, the application of a fixed time horizon different than 12 months should not be used unless the entity can evidence that the approach does not lead to lack of representativeness.
- **Risk differentiation:** measure the discriminatory power of the model in independent samples (out of sample and out of time) unless there is no sufficient available data in the training sample.
- Consideration of **climate-related and environmental risk drivers** where relevant and material for the segmentation of LGD and also for ELBE and LGD in default. 



### Estimation of ELBE that reflect current economic circumstances

Section 6.4 | Articles 191 to 193

- **The ELBE reflects the current economic circumstances** when one of the following conditions is met:
  - The model contains macroeconomic risk drivers.
  - At least one material risk driver is sensitive to economic conditions.
  - The LGD for defaulted exposures is not sensitive to economic factors.
- **Implications for the estimation of the parameter:**
  - No adjustment of LRA LGD will be required to reflect current economic circumstances.
  - **Backtesting:** the evolution of the ELBE estimates over time should be in accordance with the average realised LGD for defaulted exposures, although the variability of the ELBE time series may be lower than that of the average realised LGD for defaulted exposures.



## Credit Conversion Factor estimation -CCF-

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# ECB Guide to internal models - June 2023 Update

## Credit Risk topics: Credit Conversion Factor (CCF)



Some updates have been introduced to the Credit Conversion Factor section, such as the incorporation of the ECB's expectation regarding the **definition of “grade” or “pool”** and requirements for the application of a **fixed conservative CCF** estimate.



### CCF structure

Section 7.3 | Articles 200 to 202

**Definition of grade/pool:** subset of facilities to which the same CCF is applied for the calculation of regulatory capital requirement.

#### **CCF values based on judgmental considerations**

There are certain conditions that should be met:

- The exposures are not material
- Not enough data to be statistically representative
- The CCF value is a conservative estimate with a minimum value of 100%

In the review of estimates the institutions should verify the three conditions are still met.



## Margin of Conservatism -MoC-

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# ECB Guide to internal models - June 2023 Update

## Credit Risk topics: Margin of Conservatism (MoC)



Minor updates are introduced in the Margin of Conservatism section, which has a new section number (8). These changes are related to the inclusion of **climate-related information inaccuracies** and the ECB's expectation about the MoC reflecting uncertainty at final estimates levels.



### Model-related MoC

Section 8 | Articles 208 & 210

The ECB understands that the MoC must reflect the uncertainty at the level of the final PD estimates (namely, at the level of the grade or pool).

- General:
  - MoC should not alter the rank ordering.
  - MoC should maintain monotonicity in the final estimates while still reflecting the uncertainty at grade or pool level.
- MoC Type A: consider the deficiencies stemming from any missing or inaccurate climate-related information considered in risk estimates 🌿
- MoC Type C for calibration at segment level: New requirement to compute the MoC C at grade level to show evidence it is not statistically different from the quantification at calibration segment level.



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