Internal Credit Risk Modelling Policy

## Internal Policy on IRB Model Development for Residential Mortgage Portfolios

\*\*Document Reference:\*\* This policy document incorporates requirements and insights from the following regulatory documents:  
\* \*\*ECB Guide to internal models (EGIM)\*\*, July 2025 (Release 4.0)  
\* \*\*EBA Guidelines on PD estimation, LGD estimation and the treatment of defaulted exposures (EBA GL on PD/LGD)\*\*, EBA/GL/2017/16, 20 November 2017  
\* \*\*Response to consultation on RTS on conditions for capital... (EBA/EBA-RESPONSE/7934)\*\*, specifically noting the absence of publicly available statistics in the residential mortgage sector.

---

### \*\*Chapter 1: Principles for IRB Model Development – Residential Mortgage Portfolios\*\*

This chapter outlines the Bank's internal policy for the development, implementation, and ongoing management of Internal Ratings-Based (IRB) models specifically for its residential mortgage portfolios within the European Union. It aims to ensure compliance with relevant regulatory requirements, enhance risk sensitivity, and maintain the integrity and robustness of the Bank's credit risk management framework.

#### \*\*1.1 Overarching Principles and Governance\*\*

\*\*1.1.1 Model Life Cycle and Documentation\*\*  
The Bank shall establish and maintain comprehensive documentation for all IRB models, covering their entire life cycle from development and calibration to validation, implementation, application, and review of estimates. This documentation shall be sufficiently detailed to enable a qualified third party to independently understand the methodology, assumptions, limitations, and use of the model, and to replicate its development and implementation (EGIM, para 4).

A central register of internal models shall be maintained, including details such as model owner(s), range of application, materiality classification, approval date, any restrictions or conditions, key weaknesses, main changes applied, and versioning. This register shall also include any models or components purchased from third-party vendors (EGIM, para 6). Adequate controls, including an annual review, and a clear document management policy defining roles, responsibilities, change procedures, archiving, and access permissions, must be in place (EGIM, para 7).

\*\*1.1.2 Data Governance and Quality\*\*  
Sound data governance practices, aligned with the ECB Guide on effective risk data aggregation and risk reporting and considering standards such as DORA and BCBS 239, are mandatory for all data used as inputs for internal models. This includes robust organisational measures for data management and security throughout the data lifecycle, ensuring timely reaction to breaches (EGIM, para 9-10).

For residential mortgage portfolios, particular attention shall be paid to:  
\* Consistency in the application of human judgment for target variables, such as 'unlikeliness to pay' flags, including clear guidelines and regular analyses to prevent systematic differences (EGIM, para 11).  
\* The rigorous vetting of all data inputs, encompassing accuracy, completeness, and appropriateness (EBA GL on PD/LGD, para 15-16; EGIM, para 130).

\*\*1.1.3 Model Risk Management Framework\*\*  
The Bank shall implement and maintain a comprehensive model risk management framework to identify, understand, and manage model risk across the group. This framework shall include:  
\* A written policy defining what constitutes a model, interpreting model risk (as defined in CRD Article 3(1)(11)), and describing the framework's components (e.g., governance, risk control, validation, internal audit) (EGIM, para 12(a)).  
\* Guidelines for identifying and mitigating measurement uncertainty and model deficiencies, considering qualitative aspects like data deficiencies, model misuse, or implementation errors. This methodology shall be applied consistently across the group (EGIM, para 12(c)).  
\* Guidelines for qualitative and/or quantitative assessment and measurement of the Bank's model risk. For IRB models, the expected range of estimation errors shall be reflected in the Margin of Conservatism (MoC) (EGIM, para 12(d), fn 17).  
\* Regular complexity assessments for all internal models, classifying them based on their complexity, especially for models using Machine Learning (ML) techniques or dynamic approaches (EGIM, para 13, 33).

\*\*1.1.4 Management Body and Senior Management Responsibilities\*\*  
The roles and responsibilities of the Management Body and Senior Management, as defined in CRD Article 3(1)(7) and (9), concerning internal models for residential mortgage portfolios shall be clearly defined and documented. This includes:  
\* Approval of all material aspects of the rating and estimation processes (CRR Article 189(1); EGIM, para 26).  
\* Receipt of regular reports on the status and progress of the IRB approach, including roll-out plans, and the performance of rating systems (CRR Article 189(2)(a); EGIM, para 9, 32).  
\* Possession of a general understanding of the rating systems (Management Body) and a good understanding of their designs and operations (Senior Management), supported by ongoing training and knowledge-building processes (CRR Article 189(1) & (2)(b); EGIM, para 37-38).

\*\*1.1.5 Internal Validation and Audit\*\*  
All IRB models for residential mortgages shall be subject to initial and at least annual internal validation (EGIM, para 18). The internal validation function shall be effectively independent from the model development process, with organisational arrangements proportionate to the Bank's size, scale, and complexity (EGIM, para 19-22). The validation function must be adequately staffed with qualified personnel to conduct an effective independent challenge (EGIM, para 24).

The internal audit function shall regularly review the Bank's rating systems and their operations (CRR Article 191; EGIM, para 25). This includes an annual general risk assessment to inform the audit work plan, with deep dives for high-risk areas or highly complex/dynamic ML-based models (EGIM, para 62-63). Internal audit must be independent, report directly to the Management Body, and possess adequate resources and expertise (EGIM, para 26-27). Conclusions, findings, and recommendations shall be reported to the audit committee and/or appropriate management level, with action plans and monitoring in place (EGIM, para 28).

\*\*1.1.6 Roll-out and Permanent Partial Use (PPU)\*\*  
The Bank shall implement the IRB approach for all residential mortgage exposures, unless specific PPU permission has been granted by the Competent Authority (CA) for immaterial exposures (CRR Article 148(1), 150; EGIM, para 3). The roll-out plan, including sequential implementation, shall be clearly documented, approved by Senior Management and the Management Body, and generally not exceed five years (CRR Article 189(1), 148(2); EGIM, para 5, 8). Any changes to the approved roll-out plan require supervisory decision and must be justified against regulatory conditions (CRR Article 148(2); EGIM, para 11-13).

Ongoing monitoring of PPU compliance is required, including measures and triggers for re-assessment of materiality (EGIM, para 14). For residential mortgage portfolios, this includes monitoring exposure at default (EAD), proportion of exposure class EAD, and average risk weight.

#### \*\*1.2 Methodology and Model Development\*\*

\*\*1.2.1 Scope of Application and Segmentation\*\*  
Residential mortgage portfolios shall be assigned to rating systems that cover exposures with common risk drivers, creditworthiness, and comparable availability of credit-related information (EBA GL on PD/LGD, para 12). Within a rating system, the PD and LGD models may comprise various calibration segments, reflecting subsets of exposures with significantly different risk levels (EBA GL on PD/LGD, para 12, 97). All exposures within a rating system must be assigned to a common obligor rating scale and a common facility rating scale (EBA GL on PD/LGD, para 13).

\*\*1.2.2 Data Requirements for Model Development\*\*  
The Reference Data Set (RDS) used for model development shall contain values of risk drivers for appropriate points in time, considering the dynamics and update frequency of the information. For residential mortgages, this includes borrower characteristics, property information, loan-to-value (LTV), debt-to-income (DTI), payment history, and macroeconomic factors (EBA GL on PD/LGD, para 56-57).

The representativeness of data for model development shall be rigorously analysed in terms of scope of application, definition of default (DoD), distribution of relevant risk characteristics, and lending standards/recovery policies (EBA GL on PD/LGD, para 21). Material differences in key risk characteristics shall be addressed by selecting an appropriate data sample or by adequately reflecting these characteristics as risk drivers (EBA GL on PD/LGD, para 25).

\*\*1.2.3 Risk Drivers and Rating Criteria\*\*  
For residential mortgage models, a broad set of information relevant to the exposure type shall be considered as potential risk drivers. This includes:  
\* \*\*Obligor characteristics:\*\* income stability, employment status, credit history, household size.  
\* \*\*Transaction-related characteristics:\*\* LTV ratio, original loan amount, maturity, repayment type (e.g., amortising, interest-only), interest rate type (fixed/variable), collateral details, existence of unfunded credit protection.  
\* \*\*Property-specific factors:\*\* property type (e.g., apartment, house), location (e.g., NUTS 1, 2 or 3 as defined by Eurostat), marketability, and climate-related/environmental risks where relevant and material (EBA GL on PD/LGD, para 57, 121; EGIM, para 202, 281).

Relevant business experts shall be consulted on the business rationale and risk contribution of selected risk drivers (EBA GL on PD/LGD, para 58). The decrease in reliability of information over time (e.g., outdated financial statements or credit bureau data) must be appropriately reflected in PD estimation, potentially through adequate and conservative adjustments in the model or assignment process (EBA GL on PD/LGD, para 59). Risk drivers and rating criteria shall be used consistently across model development, calibration, and application, with respect to their relevant time horizon (EBA GL on PD/LGD, para 60).

\*\*1.2.4 Rating Philosophy\*\*  
The Bank shall define its rating philosophy for residential mortgage portfolios, understanding its impact on rating assignment dynamics and the volatility of own funds requirements. This includes assessing how sensitive the rating assignment process is to economic conditions and how changes in portfolio default rates are reflected (EBA GL on PD/LGD, para 66). This philosophy shall be applied consistently over time and considered for back-testing purposes (EBA GL on PD/LGD, para 67).

\*\*1.2.5 Homogeneity of Grades or Pools\*\*  
Obligor and facility grades or pools for residential mortgages shall be defined to ensure sufficient homogeneity of risk within each grade and meaningful differentiation of risk across grades. Each obligor or facility within a grade or pool should have a reasonably similar default risk, and significant overlaps in default risk distributions between grades should be avoided (EBA GL on PD/LGD, para 69; EGIM, para 210, 284).

\*\*1.2.6 Machine Learning (ML) Techniques\*\*  
Where ML techniques are employed in IRB model development for residential mortgages, their use must be justified, and their complexity must be motivated, avoiding unnecessarily complex approaches (EGIM, para 57, 60). The Bank shall ensure:  
\* \*\*Bias mitigation:\*\* Identify all relevant hyperparameters, and their determination shall be based on the model’s ability to generalise, using data samples independent of the training data. Potential bias from applying ML components to observations included in their training data (e.g., sequential use affecting homogeneity or PD bias) must be assessed and addressed (EGIM, para 57-58).  
\* \*\*Explainability and interpretability:\*\* Rely on explainability techniques and tools to support the plausibility and intuitiveness of estimates, quantifying the contribution of individual risk drivers globally and for specific predictions (EGIM, para 62). The resulting explanations must be robust, accurate, and actionable, with different levels of detail provided to various stakeholders (EGIM, para 64-65). These techniques and tools, including their weaknesses, must be documented (EGIM, para 66).  
\* \*\*Replicability:\*\* Documentation of ML components must allow for replication, including parameter and hyperparameter determination, and storage of random seeds and observation ordering where relevant (EGIM, para 59).

#### \*\*1.3 Risk Quantification\*\*

\*\*1.3.1 Definition of Default (DoD)\*\*  
The Bank's DoD shall strictly adhere to CRR Article 178, encompassing both the 'days past due' (DPD) criterion and the 'unlikeliness to pay' (UTP) criterion (EGIM, para 147).

\* \*\*Consistency of Application:\*\* The DoD shall be applied consistently at the obligor level across all exposures to the institution, its parent, or any subsidiaries. Mechanisms or procedures for consistent identification of default across the banking group must be in place, with clear monitoring processes for common obligors and defined actions for threshold breaches (EGIM, para 148-149).  
\* \*\*Days Past Due (DPD) Criterion:\*\* For residential mortgages, a default is triggered when an obligor is more than 90 consecutive days past due on a material credit obligation (exceeding €100 and 1% of total on-balance sheet exposures) (CRR Article 178(1), (2)(d); ECB Regulation (EU) 2018/1845; EGIM, para 147(b)). The calculation must be driven by the exact number of days, not proxies like 'months in arrears' (EGIM, para 154).  
\* \*\*Unlikeliness to Pay (UTP) Criterion:\*\* The Bank shall define and document additional indications of unlikeliness to pay beyond those in CRR Article 178(3), appropriate for residential mortgages, such as factors affecting repayment capacity based on property value and marketability (EBA GL on DoD, para 58-59; EGIM, para 169). External information, where available, shall be incorporated into the default identification process (EBA GL on DoD, para 60; EGIM, para 169).  
\* \*\*Return to Non-Defaulted Status:\*\* Minimum probation periods and conditions for reclassification to non-defaulted status, as per EBA GL on DoD, shall be applied. For exposures subject to distressed restructuring, no past due credit obligations should exist (EGIM, para 170-172).  
\* \*\*Consistency of External Data:\*\* Where external or pooled data are used for risk quantification, the underlying DoD must be understood. If different from the internal DoD, appropriate adjustments must be made to achieve broad equivalence, or a DoD-related MoC applied (CRR Article 178(4); EGIM, para 174-175).  
\* \*\*Adjustments to Risk Estimates:\*\* Any change to the DoD requires prior CA approval (CRR Delegated Regulation (EU) No 529/2014 Annex I, Part II, Section 1(3); EGIM, para 177). If the change impacts risk differentiation, model redevelopment, not just recalibration, may be necessary (EGIM, para 178). A DoD-related MoC shall be applied to cover uncertainty from data deficiencies or adjustment quantification arising from DoD changes (EBA GL on DoD, para 11(c), 70; EGIM, para 180).

\*\*1.3.2 Probability of Default (PD) Estimation\*\*

\*\*1.3.2.1 Data Requirements and Calculation of Default Rates\*\*  
The RDS for PD calibration shall contain complete quantitative and qualitative data for calculating one-year default rates, including criteria for identifying exposure types and calibration segments, and all risk drivers. Missing data on risk drivers shall be minimised over time, and appropriate adjustments and MoC applied where necessary (EBA GL on PD/LGD, para 70).

One-year default rates shall be calculated at least quarterly for residential mortgage portfolios (EBA GL on PD/LGD, para 78). The denominator shall include all non-defaulted obligors with any credit obligation at the beginning of the period. The numerator shall include those that defaulted (EBA GL on PD/LGD, para 73). Overrides shall be taken into account, but no credit risk mitigation (CRM) substitution effects or ex post conservative adjustments (EBA GL on PD/LGD, para 74).

The observed average of one-year default rates shall be calculated for each rating grade, pool, and calibration segment (EBA GL on PD/LGD, para 79). The Bank shall justify its approach to calculating the average, considering biases from short-term contracts or specific calculation dates (EBA GL on PD/LGD, para 80). For retail exposures, including residential mortgages, weighted averages may be used if more recent data are better predictors of losses (CRR Article 180(2)(e); EBA GL on PD/LGD, para 81).

\*\*1.3.2.2 Long-Run Average (LRA) Default Rate\*\*  
The historical observation period for LRA PDs shall be as broad as possible, comprising at least the five most recent years, and shall be extended if necessary to reflect the likely range of variability of default rates, including a representative mix of good and bad years (CRR Article 180(1)(h), (2)(e); EBA GL on PD/LGD, para 82-83). If the historical period is not representative, adjustments to the observed average default rate are required (EBA GL on PD/LGD, para 85). The Bank shall compare its LRA DR with a reference LRA DR (e.g., Jan 2008-Dec 2018) to guide its assessment (EGIM, para 237-238).

\*\*1.3.2.3 PD Calibration\*\*  
PD calibration shall ensure that PD estimates assigned to grades or pools reflect the LRA default rate at the relevant level (EBA GL on PD/LGD, para 88). Calibration shall be performed after considering any overrides and before applying MoC or regulatory floors (EBA GL on PD/LGD, para 89). The calibration sample shall balance comparability to the current portfolio with representativeness of the likely range of variability of default rates (EBA GL on PD/LGD, para 88).

\*\*1.3.3 Loss Given Default (LGD) Estimation\*\*

\*\*1.3.3.1 LGD Estimation Methodologies\*\*  
LGD estimates for residential mortgages shall be based on the Bank's own loss and recovery experience, supplemented by external data where necessary. Methodologies based purely on market prices are not permitted (EBA GL on PD/LGD, para 102). For retail exposures, LGDs may be derived from realised losses and appropriate PD estimates, ensuring consistency with the economic loss concept (CRR Article 161(2), 181(2)(a); EBA GL on PD/LGD, para 103). Multiple defaults on a single facility within nine months of return to non-defaulted status shall be treated as a single, continuous default for LGD estimation purposes (EBA GL on PD/LGD, para 101).

\*\*1.3.3.2 Data Requirements for LGD Estimation\*\*  
The RDS for LGD estimation shall cover all defaults identified during the historical observation period, including data for calculating realised LGDs and relevant loss drivers (EBA GL on PD/LGD, para 107). This includes detailed information on collateral, its valuation, and realisation processes (EBA GL on PD/LGD, para 109). Information about risk drivers shall be used consistently, with values from before the moment of default to align with non-defaulted exposures (EBA GL on PD/LGD, para 122).

\*\*1.3.3.3 Recoveries from Collateral\*\*  
Recoveries from collateral, including repossession and sale of the underlying property, shall be recognised. For repossessed collateral, an appropriate haircut reflecting valuation errors, potential sale price, and costs shall be applied (EBA GL on PD/LGD, para 115-117). The haircut should be estimated assuming the Bank intends to sell the asset as soon as reasonably possible. Where historical observations of repossessions and sales exist, haircuts shall be supported by this data and regularly back-tested (EBA GL on PD/LGD, para 117(c)).

\*\*1.3.3.4 Calculation of Economic Loss and Realised LGD\*\*  
Realised LGD for residential mortgages shall be calculated as the ratio of economic loss to the outstanding amount of the credit obligation at default (CRR Article 4(1)(55); EBA GL on PD/LGD, para 131). Economic loss includes the outstanding amount at default, increased by material direct and indirect costs, and reduced by recoveries, all discounted to the moment of default (EBA GL on PD/LGD, para 132).

\* \*\*Discounting Rate:\*\* All recoveries, costs, and additional drawings after default shall be discounted using an annual rate comprising a primary interbank offered rate (e.g., 3-month EURIBOR or comparable liquid rate in the exposure currency) plus a 5%-point add-on (EBA GL on PD/LGD, para 143).  
\* \*\*Costs:\*\* All material direct and indirect costs related to the recovery process, including those incurred before default, shall be included in the economic loss calculation (EBA GL on PD/LGD, para 144-146).  
\* \*\*Cured Cases:\*\* For residential mortgages returning to non-defaulted status, economic loss shall be calculated as for other defaulted exposures, with an "artificial cash flow" equivalent to the outstanding amount at the time of return to non-defaulted status, discounted to the moment of default (EBA GL on PD/LGD, para 135).

\*\*1.3.3.5 Long-Run Average LGD\*\*  
The historical observation period for LRA LGD shall be as broad as possible, containing data from various economic circumstances (EBA GL on PD/LGD, para 147). All available internal data, including incomplete recovery processes, must be included (EBA GL on PD/LGD, para 147(e), 153). The LRA LGD shall be calculated as an arithmetic average of realised LGDs weighted by the number of defaults (EBA GL on PD/LGD, para 150).

For incomplete recovery processes, future recoveries and costs shall be estimated only up to a defined maximum period of recovery, which reflects the expected time during which the vast majority of recoveries are realised (EBA GL on PD/LGD, para 156, 158). Any uncertainty related to these estimations shall be reflected in the MoC (EBA GL on PD/LGD, para 159(f)). Realised LGDs that result in a negative number (profit) shall be floored at zero for the calculation of observed and LRA LGDs (EBA GL on PD/LGD, para 160).

\*\*1.3.3.6 Downturn LGD\*\*  
LGD estimates for residential mortgages shall be appropriate for an economic downturn, as characterised by Commission Delegated Regulation (EU) No 2021/930, and derived in accordance with the EBA Guidelines on downturn LGD (EGIM, para 298). Downturn LGD shall not be calibrated at a more aggregate level than the LRA LGD (EGIM, para 299). The calibration shall assess the observed impact of identified downturn periods, including elevated average realised LGDs and any relevant components (EGIM, para 300-303). A reference value, calculated from the two worst years with the highest observed economic loss, shall be used for comparison with the final downturn LGD estimates (EBA GL on downturn LGD, para 37; EGIM, para 304-308).

\*\*1.3.4 Estimation of ELBE and LGD in-default\*\*

\*\*1.3.4.1 General Requirements\*\*  
ELBE and LGD in-default estimates for defaulted residential mortgages shall use the same estimation methods as LGD for non-defaulted exposures (EBA GL on PD/LGD, para 167). Reference dates for grouping defaulted exposures shall be set based on observed recovery patterns, rather than the date of default (EBA GL on PD/LGD, para 171). Post-default information shall be considered in a timely manner (EBA GL on PD/LGD, para 168).

\*\*1.3.4.2 Specific Requirements for ELBE\*\*  
ELBE shall represent the best estimate of expected loss given current economic circumstances and exposure status (CRR Article 181(1)(h); EBA GL on PD/LGD, para 183). ELBE shall not include any MoC (EBA GL on PD/LGD, para 182). If the model already incorporates economic factors or is not sensitive to them, no further adjustments to the LRA LGD for defaulted exposures are needed to reflect current economic circumstances (EBA GL on PD/LGD, para 184; EGIM, para 310).

\*\*1.3.4.3 Specific Requirements for LGD in-default\*\*  
LGD in-default shall reflect at least downturn conditions if more conservative than the LRA LGD for defaulted exposures (EBA GL on PD/LGD, para 189). It shall also cover any increased loss rate from possible additional unexpected losses during the recovery period (CRR Article 181(1)(h); EBA GL on PD/LGD, para 190). The LGD in-default should generally be higher than the ELBE (EGIM, para 311).

\*\*1.3.5 Conversion Factors (CCF) Estimation\*\*

\*\*1.3.5.1 Scope and Data\*\*  
IRB-CCFs shall be used for undrawn revolving commitments in residential mortgage portfolios, provided they would not be subject to a 100% SA-CCF. The exposure value is subject to a CCF input floor (CRR Article 166(8), (8b), (8c); EGIM, para 312). The RDS for CCF estimation shall include all credit obligations (accrued interest, fees, excess drawings) and not be capped at principal or limit (EGIM, para 315).

\*\*1.3.5.2 Calculation of Realised CCFs\*\*  
Realised CCF shall be calculated at a single facility level for each default as the ratio of the change in drawn amount at default to the committed but undrawn amount at the reference date (CRR Article 4(1)(56), 182(1)(a); EGIM, para 317). The definition of exposure must be identical to that used for LGD estimation, ensuring consistent treatment of post-default drawings (EGIM, para 317(b)).

\*\*1.3.5.3 CCF Structure and Quantification\*\*  
IRB-CCF models shall reflect material risk drivers, including changes in customer product mix, and align with the Bank's policies regarding account and limit monitoring (EGIM, para 319). The LRA CCF shall be calculated from a broad historical observation period covering different economic circumstances (EGIM, para 322). Downturn IRB-CCFs, appropriate for an economic downturn, shall be determined by assessing elevated levels of realised CCFs during stress periods (CRR Article 182(1)(b); EGIM, para 323). The model shall be robust against the "region of instability" where facilities are close to fully drawn (CRR Article 182(1c); EGIM, para 324).

#### \*\*1.4 Appropriate Adjustment and Margin of Conservatism (MoC)\*\*

\*\*1.4.1 Identification of Deficiencies and Appropriate Adjustment\*\*  
The Bank shall identify all deficiencies in its residential mortgage IRB models that lead to bias in risk quantification or increased uncertainty. These deficiencies shall be classified into Category A (data and methodological deficiencies) or Category B (changes to underwriting standards, policies, or external environment) (EBA GL on PD/LGD, para 36-37). Appropriate adjustments shall be applied to correct identified biases, aiming for the most accurate "best estimate" of the risk parameter. These adjustments must be documented, justified, and regularly monitored (EBA GL on PD/LGD, para 38-40).

\*\*1.4.2 Margin of Conservatism (MoC)\*\*  
A MoC shall be added to the best estimate of each risk parameter for residential mortgages. This MoC shall reflect the uncertainty of the estimation across three categories:  
\* \*\*Category A:\*\* MoC related to identified data and methodological deficiencies.  
\* \*\*Category B:\*\* MoC related to relevant changes to underwriting standards, risk appetite, collection and recovery policies, and any other sources of additional uncertainty.  
\* \*\*Category C:\*\* General estimation error (EGIM, para 325; EBA GL on PD/LGD, para 42).

The MoC for Category C must be greater than zero. MoCs for Categories A and B must be greater than or equal to zero and proportionate to the increased uncertainty (EBA GL on PD/LGD, para 47). For residential mortgages, MoC shall particularly address:  
\* The use of external or pooled data, which generally results in higher estimation uncertainty (EGIM, para 174). The EBA GL on PD/LGD (para 37(a)(viii)) suggests applying a Category A MoC in such cases.  
\* The quantification of the MoC for PD shall reflect statistical uncertainty/sampling error in the LRA estimate at grade/pool level, driven by the number of observations and time series length (EGIM, para 327(a)).  
\* For LGD and CCF, MoC shall reflect statistical uncertainty/sampling error affecting the final estimates, driven by the uncertainty of observations and time series length (EGIM, para 327(b)).

The final MoC for a risk parameter estimate shall be the sum of the MoCs from Categories A, B, and C (EBA GL on PD/LGD, para 45). All quantification and aggregation methods for MoC shall be documented and regularly monitored (EBA GL on PD/LGD, para 50).

#### \*\*1.5 Model Performance Assessment\*\*

\*\*1.5.1 Ongoing Monitoring and Review of Estimates\*\*  
The Bank shall have a robust framework for the regular review of estimates for residential mortgage models, performed at least annually (CRR Article 179(1)(c); EGIM, para 328; EBA GL on PD/LGD, para 217). This framework shall define:  
\* Minimum scope and frequency of analyses, including predefined metrics for data representativeness, model performance, predictive power, and stability.  
\* Predefined standards, thresholds, and significance levels for these metrics.  
\* Predefined actions for adverse review results (EBA GL on PD/LGD, para 217).

Annual reviews shall include:  
\* Analysis of data representativeness, comparing the RDS (for quantification and development) with the application portfolio (EBA GL on PD/LGD, para 218(a)).  
\* Analysis of model performance and stability over time, identifying any deterioration in discriminatory power on relevant subsets (e.g., with and without delinquency status) (EBA GL on PD/LGD, para 218(b)).  
\* Analysis of the predictive power, including the impact of recent data on LRA default rates, LRA LGD, or downturn LGD, and a back-testing analysis comparing estimates against observed outcomes for each grade or pool (EBA GL on PD/LGD, para 218(c)). For LGD models with components (e.g., secured/unsecured), back-testing shall be run at both component and facility levels (EGIM, para 330(c)).

\*\*1.5.2 Machine Learning Model Performance\*\*  
For ML-based models, internal validation shall explicitly assess:  
\* Overfitting, and performance using out-of-sample and out-of-time data (EGIM, para 43(a)).  
\* The effectiveness of explainability techniques in identifying model inefficiencies, performance deterioration, and deviations in risk estimates (EGIM, para 43(c)).

\*\*1.5.3 Human Judgement and Overrides\*\*  
The impact of human judgement on risk differentiation capability shall be assessed (EBA GL on PD/LGD, para 218(b)). The Bank shall monitor the level and justifications for overrides, with maximum acceptable rates defined for each model. Excessive overrides may indicate model weaknesses requiring improvement (EBA GL on PD/LGD, para 205; EGIM, para 93). The performance of overridden exposures shall be regularly analysed (CRR Article 172(3); EGIM, para 92).

#### \*\*1.6 Other Relevant Factors\*\*

\*\*1.6.1 Use of Machine Learning (ML) Techniques\*\*  
The use of ML techniques in IRB models for residential mortgages shall be viewed as a driver in their complexity and materiality assessments, leading to higher expectations for management reporting and internal validation (EGIM, para 34). The Bank's changes policy must define what constitutes a change for ML-based models, and dynamic ML models require effective monitoring of their evolution (EGIM, para 38, 41). The Bank's IT infrastructure must support the complex data and computational needs of ML models, providing traceable solutions for auditability and replicability (EGIM, para 52-53).

\*\*1.6.2 Third-Party Involvement\*\*  
Where third parties are involved in internal model-related tasks (e.g., data provision, model development/maintenance), the Bank remains ultimately responsible. Outsourcing arrangements must comply with EBA Guidelines on outsourcing arrangements, ensuring transparency, full access to information for the Bank and CA, and appropriate in-house knowledge retention (EGIM, para 81, 86-87). For residential mortgage models using pooled or external data, the Bank must assess the representativeness of the data and understand the third party's methodology (EGIM, para 90(b)&(c)).

\*\*1.6.3 Data Scarcity and External Statistics\*\*  
For residential mortgage models, particularly concerning publicly available statistics, the Bank acknowledges that "there are no publicly available statistics" in this sector (EBA/EBA-RESPONSE/7934). This lack of external data may necessitate greater reliance on internal data and, where internal data is scarce, may lead to higher uncertainty and consequently a larger Margin of Conservatism (MoC) (EGIM, para 196). The Bank shall justify any use of external data by demonstrating its representativeness and the outweighing benefits compared to identified drawbacks (EGIM, para 187).

\*\*1.6.4 Climate-related and Environmental Risks\*\*  
The Bank shall assess the materiality of climate-related and environmental (C&E) risks in the life cycle of its residential mortgage models. Where C&E risk drivers are found to be relevant and material, they shall be included in the internal models (EGIM, para 29). This includes considering C&E risk drivers when identifying potential risk drivers for PD and LGD estimation (EGIM, para 202, 281). Where insufficient information on C&E risk drivers exists, the Bank shall consider a more conservative approach in rating assignment, potentially through overrides (EGIM, para 80, fn 77).

---