

Technical Annex of Credit Risk Model Validation

Data Representativeness:

Under Article 40 (EBA) Data requirements,

- Assess whether data gathering process is clearly described and re-performable.
- Verify that data sources and data merging techniques (primary key of the tables, structure of the database) are clearly described, substantiated and applied.
- Verify that data from different resources cover the same time period, if not assess additional data manipulation techniques used.
- Verify that cross checks and data sanity checks are implied in model development process. Re-perform (if applicable) data quality checks such as described statistics and cross checks to assess the quality of the check performed.
- Verify that the missing values are analyzed and treated in data manipulation process of model development project.
- Verify that (if exist) the bucketing methodology or risk driver transformation process is sound and in line with business expectations. FW
- Verify that exclusion cases are clearly defined, substantiated and the ratio of exclusions/total portfolio and the potential impact on the parameter estimation is analyzed.
- Assess whether there is a procedure in order to avoid over fitting of the model/data.

For PD Models:

- Assess whether definitions such as observation period, and performance period are clearly defined, substantiated and documented.

For LGD Models:

- Assess whether definitions such as work out period, recovery rate, no-loss, cure rate are clearly described and substantiated.

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- Assess the comparability of the underwriting and recovery standards with the ones applied at the time of the reference data set used for the modeling.

For EAD Models:

- Assess whether definitions such as observation moment, default moment, limit and exposure are clearly described and substantiated.

Risk Driver selection process is sound and complete

- Verify that all relevant risk drivers are selected for long list.
 - Assess whether the variable selection process is in line with the methodology standards document. i.e. important risk drivers are used for PD, LGD and EAD predictions. If not, the decision is clearly substantiated. In case of expert judgment, verify that expert judgment is substantiated and in line with business expectations.
1. Verify that the definitions of the risk drivers and risk driver selection process are clearly documented.
 2. Verify that the correlation between the risk drivers and model outcome is in line with the business expectations.

For PD Models:

1. Verify that univariate analysis is performed (example C-Stat) for each risk driver and initial elimination of the risk drivers is performed according to pre-defined threshold.
2. Verify that Short list of risk drivers is selected considering the correlations between risk drivers and performance of the risk drivers. (Example Cramer's V Test)