

MRM Periodic Review

{{modelName}}

Confidential



Report Date: 16 July 2020 Workstream: Pillar One

Version: 1.0 ImProve ID: GMXXXX

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**Summary of Validation Periodic Review Outcome**

This MRM periodic review covers model Corporate Credit Rating Model under ImProve ID {{modelId}}. the periodic review outcome is: *the model is satisfactory but requires actions.*

**Tier**

The model tier is Tier 2 due to following reasons:

* Reliance: High
* Materiality: High
* Design Complexity: Medium
* Operational Complexity: Low

**Findings**

There are no findings raised as a part of current periodic review. There is one open severity-

2 finding around documentation and one severity-3 finding around implementation raised as a part of a previous revalidation. The details of all the findings are stated below:

**Severity 2 documentation finding:**

The model documentation is not sufficiently detailed to permit the model validator to assess the methodology in detail. In particular the calibration process, and the source of data for this step is not described. [IDXX1]

**Severity 3 implementation finding:**

There is an error in the model implementation: formula 4 in the model documentation is incorrectly implemented. Model owner testing has demonstrated however that the impact is not material. [IDXX2].

**Recommendations**

No recommendations were given in this periodic review

## Executive Summary

### Model Purpose and Intended Use

The model generates through-the-cycle credit ratings for corporate obligors which are then used for regulatory and economic capital calculations. The model is applied to all Credit Suisse legal entities including CUSO.

### Model Description

An ordered logistic regression is performed using various financial ratios. Calibration is through an external data set. However, due to the small number of historical defaults, the Pluto-Tasche method is additionally employed to place a limit on the default probability.

### Model Assumptions, Limitations and Uncertainties

The key model assumptions and limitations of the models are:

Assumptions:

* The calibration data set is representative of the bank's portfolio
* The defaults in the calibration dataset are independent of one another
* The independent variables in the regression model are not significantly multicolinear

Limitations:

* Low default portfolios are modelled using an upper bound to the PD

For detailed assumptions and limitations, please refer to model documentation [1] and ongoing monitoring report [2].

### Open Model Findings

There is one open severity-2 finding around documentation and one severity-3 finding around implementation raised as a part of a previous revalidation [3].

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| # | ImProve ID | Type | Model Risk Topic | Review Finding or Recommendation | Ref in Report | Internal Deadline | Owner |
| 1 | XX1 | Severity 2 | Documentation | Inadequate documentation of methodology | Raised in a previous revalidation | 01.10.2020 | John Smith |
| 2 | XX2 | Severity 3 | Implementation | Error in implementation | Raised in a previous revalidation | 01.10.2020 | John Smith |

Table 1 – Open Model Findings

### Periodic Review Summary and Outcome

The periodic review outcome is “The model is satisfactory but requires actions”. No new findings are raised as a result of the periodic review. The key model assumptions and limitations are still valid. There was one model change regarding model calibration since last full validation against which no findings are raised in this periodic review. The model tier remained unchanged at Tier 2.

Chi-squared test for industry distribution and for rating distributions were performed by the model developer and supported the assumption that the calibration portfolio was representative. A test for multicolinearity (variance inflation factor) was performed by the model developer and supported the assumption that the independent variables are not significantly multicolinear. The model developer performed a test of the impact of recalibration on portfolio PD which showed that the impact of the reclibration was within acceptable limits.

## Model Overview

Complete model details can be found in the most recent full validation [3].

### Model Materiality

In this section:

* Assess whether the materiality of the model has significantly changed since the previous full validation/periodic review and provide a justification
* Highlight any major changes

Note that this information should be consistent with information captured in the firm-wide model inventory (i.e., ImProve).

### Model Changes

Provide a summary of model changes including usage changes since the precious full validation/periodic review. Specify in cases where there are no model changes.

## MRM Review

The sections below should document the components of MRM’s periodic reviews and should be sufficiently detailed to identify any new issues related to the ongoing use of the model that have become material since the previous full validation/periodic review and determine whether existing validation activities remain to be sufficient. The reviews should to take into account all model usages and the extent and depth of periodic reviews must be commensurate with the model tier and class.

### Re-assessment of Model Risk Tier

This section should provide a re-assessment of the model tier with a review of any changes in Reliance, Materiality, and Complexity since the last model tier review. Detailed guidance on the model risk tiering process is provided in the Model Identification and Tiering Manual (X0029).

### Review of Model Changes

As applicable, provide an assessment of the cumulative impact of changes made to the model since the last full validation/periodic review. A cumulative impact of multiple small changes may warrant a detailed review of a model although each of such model changes separately may not trigger a review. Specify in case there is no model change impact.

### Review of developments in industry modelling practices

As applicable, mention any known theoretical advances or developments in leading modelling practices/regulatory expectations since the previous full validation/periodic review and confirm that the model is still up to current standards or highlight any required model changes.

### Review of Changes in Business, Market, Regulatory Environments

In this section, assess whether any changes in the business, market and regulatory environment have an impact on the model and confirm that the model is still theoretically sound and continues to be fit for purpose. Changes in the business environment could for example include changes in product characteristics, portfolio composition or consumer behaviours.

### Review of Model Assumptions, Limitations and Compensating Controls

In this section, assess whether any changes in the business and the market conditions have an impact on the appropriateness of key model assumptions, limitations, uncertainties and compensating controls and confirm that they continue to be fit for purpose.

### Review of Open Model findings

In this section, review the status of open validation/Internal Audit/regulatory findings, confirm finding severity and escalate them to the appropriate stakeholders as appropriate.

### Ongoing Monitoring

If applicable, in this section, review and assess the adequacy of the ongoing monitoring conducted by model owners and/or developers since the last full validation/periodic review with a particular focus on any identified issues (e.g., exceeded monitoring thresholds). Ensure that the ongoing monitoring in place is adequate to ensure that any changes that may result in a change in tier would be captured.

If statistical tests are performed, the validator should review the interpretation of the test outcomes and the follow up actions for negative test outcomes.

Documentation standard for diagnostic and statistical testing: When statistical tests turn out negative outcomes, solid justifications should be provided or compensating controls shall be installed. In addition, sufficient documentation should be provided for a reasonably capable third party to read and draw the same conclusion. Specific instructions are available in Section 6.1.1 of the CCAR Model Validation Tempalte.

### Additional Independent Validation Testing and Analysis

As applicable, perform any additional testing that is deemed necessary to test that the model remains appropriate.

## Review Conclusion and Findings

### Review Outcome Overview

Provide a concise summary of the outcome of the review and a descriptions of any changes or issues found and their impact on the fitness for purpose criteria.

### Validation Findings and Agreed Actions as a Result of Periodic Review

List the validation findings, raised as a result of this review including the severity, as described in the policy GP-00083.

## Document Control Information

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Date** | **Doc Version** | **Template Version** | **Reason for Change** | **Author** | |
| 23/4/2019 | 1.0 | 1.0 | Period review | xxx |
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### Periodic Review Repository

This section should provide:

* The full address where the files supporting this periodic review are stored.
* A breakdown of the name of the excel sheets (or any other tools) used for the review and their respective subfolder where they are saved. Perhaps a table format is best.

# Notation

Provide a list of abbreviations relevant for this document and their descriptions

# References

|  |  |
| --- | --- |
| [1] | FRB, “SR11-7: Supervisory Guidance on Model Risk Management,” 2011. |
| [2] | CEM, Model Risk Management, “GP-00083: Model Risk Management - Model Risk Policy,” 2019. |

# MRM Validation Periodic Review Template Version

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| --- | --- | --- | --- | --- |
| 1.0 | 07/22/2019 | Initial | Initial Model Periodic Review Template | MRM |
| *2.0* | *10/18/2019* | *Current* | *Enhanced to be consistent with new MRM templates* | *MRM* | |