



Credit Risk Modelling of Low Default Portfolios
Part I – Identification and regulatory highlights

Low Default Portfolios

Background & Identification

A portfolio is considered a low default portfolio (LDP) when default data is rare, or not available at all. This is also possible for a portfolio that is relatively new and does not have sufficient history for many defaults to have occurred.

Reasons for LDPs

There are several reasons why a portfolio may have low number of defaults:

- The portfolio is relatively small in size, either globally (e.g. sovereigns) or at an individual bank level (e.g. project finance).
- Some portfolios historically have experienced low number of defaults and are generally (but not always) considered to be low-risk (e.g. portfolios of exposures to sovereigns, banks, insurance companies or highly rated corporates).
- Low default rate is observed for certain customer groups in certain time periods. For example - There may be a short default history because either the bank is a recent market entrant for a given portfolio or there were IT system issues limiting the capture of default data historically.

Identifying LDPs

There is no unique definition of an LDP within the industry and the Basel Committee on Banking Supervision (BCBS) have indicated that bank portfolios are not either low default or non-low-default. Rather, there is a continuum between these two extremes.

Absolute threshold

One approach that can be adopted for identifying when a portfolio should be subjected to special treatment as LDP is to set an absolute threshold based on a specific number of defaults.

The number would be irrespective of the total portfolio size.

A figure of **20 defaults** is specified by regulation in the UK (PRA SS11/13 Section 12.34) and this figure has also been commonly used within the wider industry.

Formula Based

A portfolio is considered as LDP if the credibility factor Z is **less than 50% for at least three years** in the last five available snapshots (even if not consecutive). The credibility factor is defined as

$$\text{Credibility Factor } (Z) = \sqrt{\frac{\text{Observed Default}}{\text{Expected Default}}}$$

The expected default is estimated through the following formula:

$$\text{Expected Default} = \left(\frac{\Phi^{-1}\left(\frac{P+1}{2}\right)}{k} \right)^2 (1 - DR),$$

where Φ is the inverse of the normal cumulative distribution, k is the percentage error (e.g. 20%), P is the confidence interval (e.g. 95%) and DR is the default rate observed on the portfolio.

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ECB - TRIM Findings

The European Central Bank (ECB) has published the Targeted Review of Internal Models (TRIM) report in April 2021. A great number of deficiencies have been identified in low default portfolios, including the critical rating assignment process.

Summary of findings

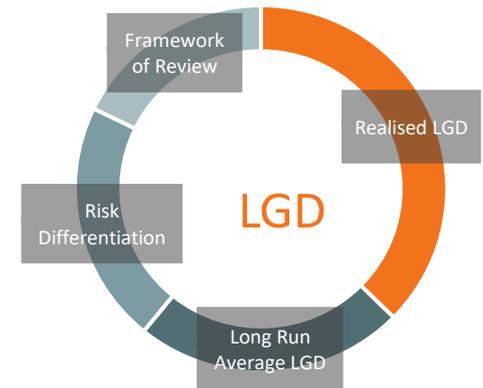
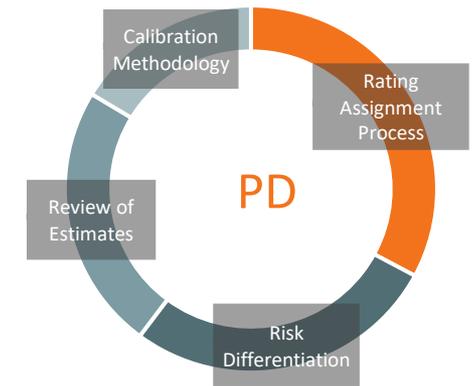
- **Number and severity of findings:** In total, there were around 1,700 findings from the TRIM investigations relating to models for LDPs, based on the 75 assessment reports that were considered for the horizontal analysis. In terms of severities of these findings, approximately 14% and 48% were classified as F1¹ and F2, respectively, while 30% and 8% of the findings were classified as F3 and F4, respectively.
- **Data Quality:** Shortcomings around data management and data quality processes were the most widespread issues, being raised in 85% of on-site investigations and representing 31% of total shortcomings. This topic also received the greatest proportion (40%) of high severity findings.

Deep-dive: Probability of Default

- **Rating Assignment Process:** Flaws were identified in the application of the assignment process due to imprecise procedures. In addition, improper use of overrides, including missing or inappropriate monitoring, and flaws in the treatment of ratings of third parties have also been flagged.
- **Risk Differentiation:** Flaws were identified in the selection, assessment, and construction of risk drivers. Among others, there were also errors in the implementation of the methodology.
- **Review of Estimates:** Cases where the framework for the review of estimates did not prescribe any predictive ability/back-testing/ homogeneity/ heterogeneity analysis, or were missing other relevant analyses, for example in relation to data scarcity.
- **Calibration Methodology:** The most frequent type of finding related to calibration assumptions that were not properly justified and deficiencies in the calibration analyses. Shortcomings were also observed in relation to the calculation of the long-run average default rate.

Deep-dive: Loss Given Default

- **Realised LGD:** Findings mainly related to deficiencies in the treatment of recovery flows and costs, cases where the realised LGD was not based on economic loss, discount rates not being applied and inappropriate treatment of multiple defaults.
- **Long-run Average LGD:** In many cases, calibration sample was not representative of the application portfolio. Also common were issues relating to predictive ability and cases where the LGD estimation was not based on realised LGD.
- **Risk Differentiation:** Deficiencies were identified regarding the risk drivers for LGD models, such as missing or irrelevant risk drivers. Also, there were often shortcomings related to improper justification of modelling assumptions.
- **Framework of Review:** Faults related to the framework for the review of estimates not prescribing any predictive ability/back-testing/homogeneity/heterogeneity analyses, or where a regular cycle for full review of the rating systems was not defined or implemented.



¹F1 refers to a low impact and F4 to a very high impact



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