



Methodology for Computation of Marginal Default Rate and Cumulative Default Rate

A. Background

SEBI, through circular No. SEBI/HO/MIRSD/DOS3/CIR/P/2019/70 dated June 13, 2019, issued revised norms for Credit Rating Agencies (CRAs) on computing long-term and short-term average Cumulative Default Rates (CDRs). These CDRs must be derived using the Marginal Default Rate (MDR) framework based on monthly static pools.

CRAs are required to annually disclose weighted-average 1-year, 2-year, and 3-year CDRs for:

1. Long-run averages: Past 10 financial years
2. Short-run averages: Most recent 24, 36, and 48 cohorts for 1-year, 2-year, and 3-year CDRs respectively.

SEBI also requires CRAs to publish a uniform Probability of Default (PD) benchmark scale on their websites to facilitate comparison across CRAs.

ACER reserves the right to amend this methodology from time to time in accordance with the applicable regulations, circulars, and directives issued by the regulators. This disclosure will be reviewed annually.

B. Computation Approach

- 1) **Static Pool:** A static pool comprises all outstanding, non-defaulted ratings at the beginning of the analysis period.
- 2) **Default:** A default is recorded whenever an issuer delays payment of interest or principal beyond the due date.
- 3) **Default Rate:** The percentage of issuers in the static pool that default during the specified period.
- 4) **Averaging:** Default rates across multiple static pools are aggregated using a weighted average, based on the number of issuers in each pool.
- 5) **Cohort:** A cohort refers to all issuers belonging to a particular rating category at the beginning of the year under study.
- 6) **Marginal Default Rate (MDR):** MDR represents the proportion of issuers in a cohort that default within a particular year, adjusted for withdrawals. SEBI mandates the use of monthly static pools for calculating MDR.
- 7) **Cumulative Default Rate (CDR):** CDR measures the probability of default over a longer horizon (one, two, or three years) by combining weighted average MDRs across cohorts.

C. Calculation of CDRs

Calculation of CDRs is explained below.

Calculation of 1-year, 2-year, 3-year CDRs using the MDRs.

Step 1: Formation of Static Pool

For example, all 'B'-rated issuers outstanding on March 31, 2020 form the static pool. This pool is used consistently for computing 1-year, 2-year, and 3-year CDRs.



Step 2: Computation of MDRs

Terms used:

C = Initial static pool

D1 = Defaults in Year 1

D2 = Incremental Defaults during Year 2

D3 = Incremental Defaults during Year 3

W1= Withdrawals in Year 1

W2= Incremental Withdrawals during Year 2

W3= Incremental Withdrawals during Year 3

MDR 1 : Marginal Default Rate for Year 1

MDR 2 : Marginal Default Rate for Year 2

MDR 3 : Marginal Default Rate for Year 3

CDR 1 : Cumulative Default Rate for One Year

CDR 2 : Cumulative Default Rate for Two Years

CDR 3 : Cumulative Default Rate for Three Years

(*Defaults and Withdrawals from the initial Static Pool).

Using the above inputs, Marginal Default rates for Year 1, Year 2 and Year 3 are calculated as under:

$$\text{MDR1} = D1 / (C - W1)$$

$$\text{MDR2} = D2 / (C - W1 - D1 - W2)$$

$$\text{MDR3} = D3 / (C - W1 - D1 - W2 - D2 - W3)$$

Using the MDRs calculated earlier, the Cumulative Default Rates (CDRs) for one, two, and three years are derived as follows:

First, issuer-weighted average MDRs are computed for each period. These issuer-weighted MDRs are used for calculating CDRs.

1-Year CDR:

This is simply equal to the first-year MDR, since both reflect defaults over a single year.

$$\text{CDR1} = \text{MDR1}$$

2-Year CDR:

For two years, the calculation accounts for the first-year default rate (MDR1), and the probability that an issuer survives year 1 $(1 - \text{MDR1})$ multiplied by the second-year default rate (MDR2).

Thus,

$$\text{CDR2} = \text{MDR1} + (1 - \text{MDR1}) \times \text{MDR2} = 1 - (1 - \text{MDR1})(1 - \text{MDR2})$$



3-Year CDR:

Similarly, the three-year CDR includes defaults in year 1, survivors of year 1, defaulting in year 2, and survivors of both years 1 and 2 defaulting in year 3.

So,

$$\begin{aligned} \text{CDR3} &= \text{MDR1} + (1 - \text{MDR1})\text{MDR2} + (1 - \text{MDR1})(1 - \text{MDR2})\text{MDR3} \\ &= 1 - (1 - \text{MDR1})(1 - \text{MDR2})(1 - \text{MDR3}) \end{aligned}$$

The logic mirrors that of the two-year calculation, expanding survival and default probabilities across an additional year.

Short-Run and Long-Run CDRs

Short-run:

CDR1: most recent 24 cohorts

CDR2: most recent 36 cohorts

CDR3: most recent 48 cohorts

Long-run:

Average CDRs over the previous 10 financial years.

Notes

1. Handling of Rating Withdrawals

Withdrawn ratings are removed from the static pool except for securities, where they remain until maturity or end of cohort.

However, for securities, SEBI guidelines require that withdrawn ratings continue to be factored into default rate calculations until the cohort period ends or the instrument reaches maturity, whichever comes first. This requirement stems from SEBI's allowance for early rating withdrawal when 50% of the debt has been repaid or after 3/5 years, subject to certain conditions. Consequently, all Debenture Trustees (DTs) must report any delays or defaults in debenture payments to ACER for the entire life of the instrument, even if its rating has already been withdrawn.

2. Multiple Instruments

- a) **Non-structured:** equal seniority instruments counted once; different seniorities counted separately, subject to a cap of three instances across all rating categories put together.
- b) **Structured:** same seniority counted once; different seniorities counted separately (max 3).

For structured instrument ratings, multiple instruments issued by the same trust that share identical seniority and therefore carry the same rating are treated as a single instance for default rate calculations. However, instruments from the same trust that differ in seniority are counted separately. Additionally, to prevent the default rates from being understated when an issuer has many tranches with different seniority but identical ratings, a limit of three tranches per rating category per issuer is imposed.



D. Rating of Non-Cooperative Issuers

As per SEBI guidelines, Ratings of non-cooperative issuers are included in the cohort based on the current rating.

E. Additional CDR Disclosures for Listed / Proposed-to-be-Listed Securities

Through circular no. SEBI/HO/DDHS/DDHS-RACPOD2/P/CIR/2022/113 dated August 25, 2022, SEBI mandated that, in addition to the existing disclosures, which cover non-cooperative issuers and different types of credit ratings; CRAs must also separately report two additional CDR figures applicable only to credit ratings of securities listed or proposed to be listed on a recognized stock exchange:

- i. **CDR (ii):** Includes ratings of non-cooperative issuers within the cohort under the rating category in which the instrument is currently rated.
- ii. **CDR (iii):** Excludes ratings of non-cooperative issuers from the cohort under the rating category in which the instrument is currently rated.

As required, these two additional CDRs are computed and disclosed for all relevant listed or to-be-listed securities. ACER publishes all such CDR-related disclosures on its website.