

# Valuation Methodology for Principal Protected Market Linked Debentures (PP MLDs)

## Background

CRISIL Funds and Fixed Income Research provides valuations for Principal Protected, Rated and Listed Market Linked Debentures (MLDs) having varying payoffs and different underlying benchmarks including equity indices, basket of equity stocks, commodities and others on a periodic basis. These valuations are published as per face value of INR 100 and are available on the CRISIL website. (Website link : <https://www.crisil.com/en/home/our-businesses/india-research/capital-market/crisil-market-linked-debenture-valuations.html>)

## Valuation Methodology

MLDs are a combination of derivative instruments and fixed income instruments. CRISIL uses sum-of-the-parts method to value MLDs. A typical MLD has two parts:

- The fixed income component which protects the principal invested in the MLD
- The derivative component which provides returns, linked to the market.

### 1. Valuation of Bond Portion

The valuation of the bond portion is done by discounting the face value of INR 100, using the following formula:  
Bond Portion =  $100 / (1 + R_B \%)^T$

Where

$R_B$ : Bond yield of corresponding time to maturity and credit quality of issuer

T: Residual time to defined maturity (in years)

### 2. Valuation of Option Portion

The valuation of the option portion is based on Monte Carlo simulation technique. Geometric Brownian Motion (GBM) Model along with implementation of the Local Volatility is used for simulating the underlying asset. In case of basket structures, the simulations are plotted using the Cholesky matrix which is derived from the correlation matrix

## Inputs

- Implied Volatility and Forwards for each underlying
- Risk-free rate (MIFOR)
- Borrowing cost of the issuers based on “*CRISIL Security Level Valuation*”.
- Correlation matrix for basket structures

## Policy for exceptions

- Valuation approach may see following deviations:
  - Approach change to incorporate security specific/market dynamics
  - Any other necessary steps based on CRISIL's valuation committee's discussion
- Exceptional days include but are not limited to:
  - Monetary Policies
  - Annual Budget
  - Quarter end days
  - Policy announcements
  - Macro Economic data release days
  - Any day with high volatility

## Governance mechanism

CRISIL has an internal committees comprising of President, Senior Director/s, Director/s and Associate Director/s which has following role as provided below.

- **Criteria Committee:** Valuation policy and any changes to such policies are discussed with the committee and are incorporated post approval by the committee.
- **Valuation Committee:** Matters pertaining to exceptions, mentioned above, are discussed with valuation committee and acted upon based on its feedback.

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