

CRISIL Ratings criteria for expected loss ratings for infrastructure projects

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I. Background

The EL rating for debt issued by infrastructure projects is based on the 'expected loss' (EL)¹ methodology. The EL over the life of a debt instrument is, in turn, based on the two pillars of credit risk - the probability of default (PD), and the prospects of recovery. The ratings will be assigned on a scale from CRISIL EL 1 to CRISIL EL 7, with CRISIL EL 1 representing the lowest expected loss, and CRISIL EL 7, the highest.²

The EL rating provides crucial information to investors that is more relevant in the context of infrastructure projects. These projects typically face much shorter debt tenures than their economic lives, unpredictable ramp-up periods, and volatile cash flows because of risks from the counterparty, markets and operations.

Infrastructure projects also possess significant risks such as cost and time overruns during the construction phase, mainly on account of regulatory hurdles. However, once the construction is complete and the project is stable, the credit profile usually sees an improvement. Empirical evidence shows the risk of default and loss reduces materially after stabilisation. Nevertheless, cash flow mismatches arising due to delayed payments from counterparties, and cash flow variability, could constrain the timely debt servicing ability of operational projects. Hence, even operational infrastructure projects which are fundamentally viable but face short term liquidity mismatches would have constrained credit ratings on the conventional rating scale.

However, such cash flow mismatches may not translate into sizeable losses to the investors eventually. In addition, public private partnership projects have embedded safeguards such as termination payments and contractual protection that limit losses to debt investors. By construct, conventional credit rating methodology does not adequately take into account this feature of infrastructure projects. That is where the EL rating fills the gap. It focusses on recovery of dues to investors and lenders over the life cycle of an infrastructure project, by taking into account the possibility of refinance/restructuring, and the presence of embedded safeguards (such as termination payment).

II. Scope

This EL based rating is applicable for all infrastructure projects, to start with. It can be applied to assess projects throughout their life cycle.

¹ Previous criteria may be found at: https://www.crisil.com/content/dam/crisil/criteria_methodology/expected-loss-ratings/archive/crisils-criteria-for-expected-loss-ratings-for-infrastructure-projects.pdf

² Pursuant to SEBI circular dated July 16, 2021, 'Introduction of Expected Loss (EL) based Rating Scale and Standardisation of Rating Scales Used by Credit Rating Agencies', CRISIL Ratings has aligned the EL scale with that introduced by SEBI. The earlier scale and definition used by CRISIL Ratings has been provided in the annexure for ready reference.

III. EL rating scale for infrastructure projects

The expected loss rating reflects an opinion on the expected loss to be incurred over the life of the instrument. The table below gives the rating symbols and definitions that each symbol conveys.

Rating	Definition
CRISIL EL 1 (Lowest expected loss)	Instruments rated 'EL 1' are considered to have the lowest expected loss, over the life of the instrument
CRISIL EL 2 (Very low expected loss)	Instruments rated 'EL 2' are considered to have very low expected loss, over the life of the instrument
CRISIL EL 3 (Low expected loss)	Instruments rated 'EL 3' are considered to have low expected loss, over the life of the instrument
CRISIL EL 4 (Moderate expected loss)	Instruments rated 'EL 4' are considered to have moderate expected loss, over the life of the instrument.
CRISIL EL 5 (High expected loss)	Instruments rated 'EL 5' are considered to have high expected loss, over the life of the instrument
CRISIL EL 6 (Very high expected loss)	Instruments rated 'EL 6' are considered to have very high expected loss, over the life of the instrument
CRISIL EL 7 (Highest expected loss)	Instruments rated 'EL 7' are considered to have highest expected loss, over the life of the instrument

CRISIL Ratings considers the 'life of the instrument' to be equivalent to the original maturity of the instrument, plus two-and-a-half years to account for the potential recoveries from the project which can occur even after the maturity of the debt instrument (especially of shorter duration). However, in no event can the instrument life exceed the project life.

Following table presents indicative expected loss ranges that each symbol conveys:

Rating	Indicative EL Ranges
CRISIL EL 1 (Lowest expected loss)	$\leq 1.25\%$
CRISIL EL 2 (Very low expected loss)	$1.25 < X \leq 3.5\%$
CRISIL EL 3 (Low expected loss)	$3.5 < X \leq 7.5\%$
CRISIL EL 4 (Moderate expected loss)	$7.5 < X \leq 15\%$
CRISIL EL 5 (High expected loss)	$15 < X \leq 25\%$
CRISIL EL 6 (Very high expected loss)	$25 < X \leq 35\%$
CRISIL EL 7 (Highest expected loss)	$> 35\%$

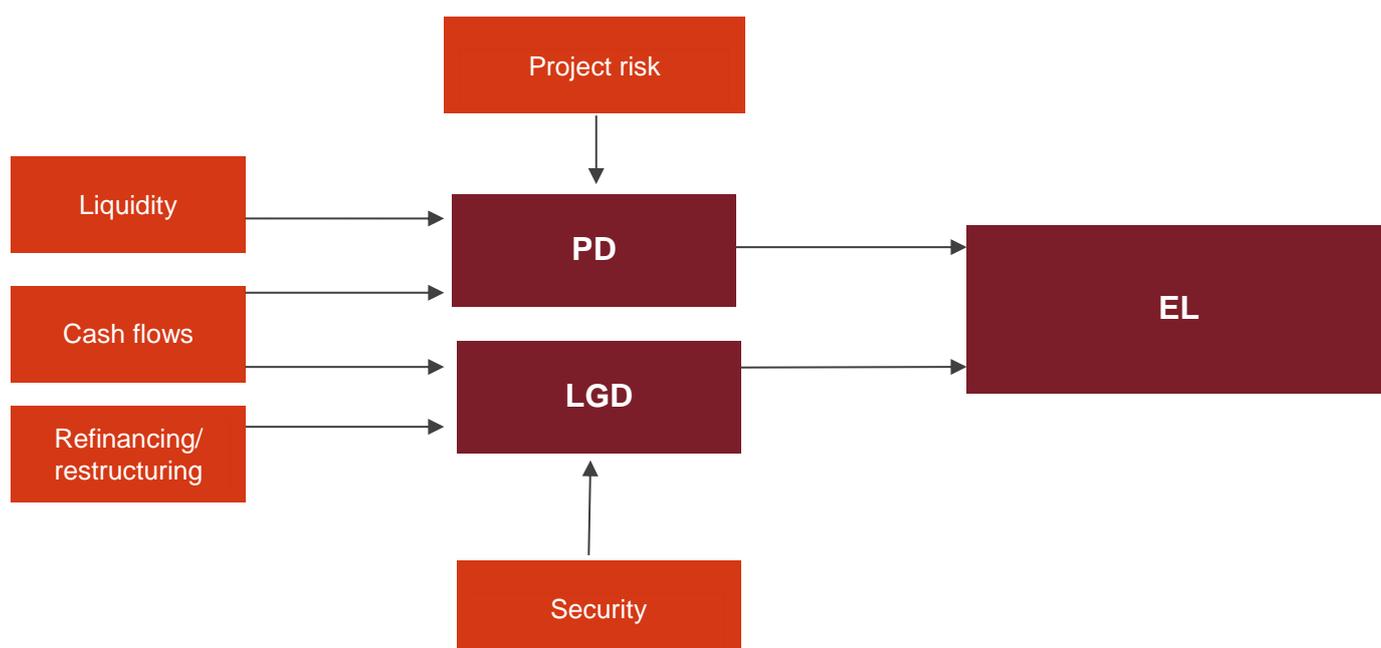
Typical project life for some infrastructure project types

Sector	Typical project life
Annuity roads	As per concession agreement
Toll roads	As per concession agreement
Sea ports	As per concession agreement
Solar power plants	15-18 years
Wind power plants	18-20 years
Thermal power plants	25 years
Transmission	35 years

IV. Methodology for computing EL

The two main components of EL for any debt instrument are:

1. Probability of default (PD), and
2. Loss given default (LGD)



IV.1 Evaluating EL

Once the PD rating and LGD have been obtained, the EL may be computed by simply multiplying the PD and the LGD, over the life of the instrument. The following section explains how, with the help of an illustration.

Expected loss computation: an illustration

Say, for a three-year bond of an issuer rated 'BBB' with annual debt service (principal and interest) of Rs. 10, there are four mutually exclusive and **exhaustive** scenarios (for the purpose of this analysis, default is assumed to be an absorbing state. That is, an instrument in default is assumed to remain in default forever).

Scenario 1 represents the possibility of the issuer defaulting on the very first instalment of debt service. Scenario 2 represents the issuer successfully servicing the first instalment but defaulting on the second, and so on. The last scenario (no.4) represents the possibility of the issuer servicing all three years of debt successfully. Each scenario is associated with a probability that is derived from CRISIL Ratings' proprietary default statistics. Also, each scenario represents a particular estimate of the shortfall in debt service on the rated instrument. The table below illustrates the scenario based analysis for the above example for an entity rated 'BBB', with no recoveries assumed

post default. Typically EL factors in time value, but for simplicity of presentation, time value has been ignored in the below table.

Scenario #	Probability of scenario**	Shortfall in debt servicing
1	4%	30 = (3 payments * Rs.10)
2	5%	20 = (2 payments * Rs.10)
3	6%	10 = (1 payments * Rs.10)
4	85%	0
2.8 (= 30 * 4% + 20 * 5% + 10 * 6% + 0 * 85%) represents 9.3% (=2.8 / 30) of cumulative debt service obligations on the instrument		

** In this example, the cumulative default rates of 'BBB' are assumed as 4% for Year 1, 9% for Year 2, and 15% for Year 3, solely for illustrative purposes.

IV.2 Probability of default

Ratings on the PD approach, i.e., the existing rating scale AAA to D,³ is an important input for arriving at the ratings based on EL approach. A default under PD ratings is recognised on a 'one-day, one-rupee' basis – which means, even if there is a delay of one day, or a shortfall of one rupee in fulfilling the debt obligations, the instrument is considered to be in default.

CRISIL Ratings has well defined criteria for assigning these ratings, with different criteria developed for some sectors and instruments to capture all their nuances specifically. These rating criteria have already been published. For example, the PD based rating of infrastructure projects focuses more on project risk, adequacy of cash flows to service debt (DSCR), and liquidity.⁴

CRISIL Ratings methodology for EL ratings is, in addition, designed scientifically to simulate all the possible default scenarios of the instrument, based on historical default rates read from CRISIL Ratings proprietary default statistics.⁵

IV.3 Loss given default

LGD indicates the extent of loss on a debt instrument over its life, after an issuer has defaulted on its repayment obligations on the particular instrument, and the PD rating has gone into default category. The LGDs of projects are

³ Refer CRISIL criteria on rating scales and methodology:

https://crisil.com/content/dam/crisil/criteria_methodology/basics-of-ratings/CRISILs_rating_and_rating_scales.pdf

https://www.crisil.com/content/dam/crisil/criteria_methodology/basics-of-ratings/CRISILs_bank_loan_ratings_process_scales_and_default_recognition.pdf

⁴ Refer CRISIL criteria on infrastructure. https://www.crisil.com/content/dam/crisil/criteria_methodology/infrastructure/CRISIL-Ratings-criteria-toll-road-projects_2007.pdf

https://www.crisil.com/content/dam/crisil/criteria_methodology/infrastructure/crisil-criteria-for-rating-annuity-road-projects-oct-2020.pdf

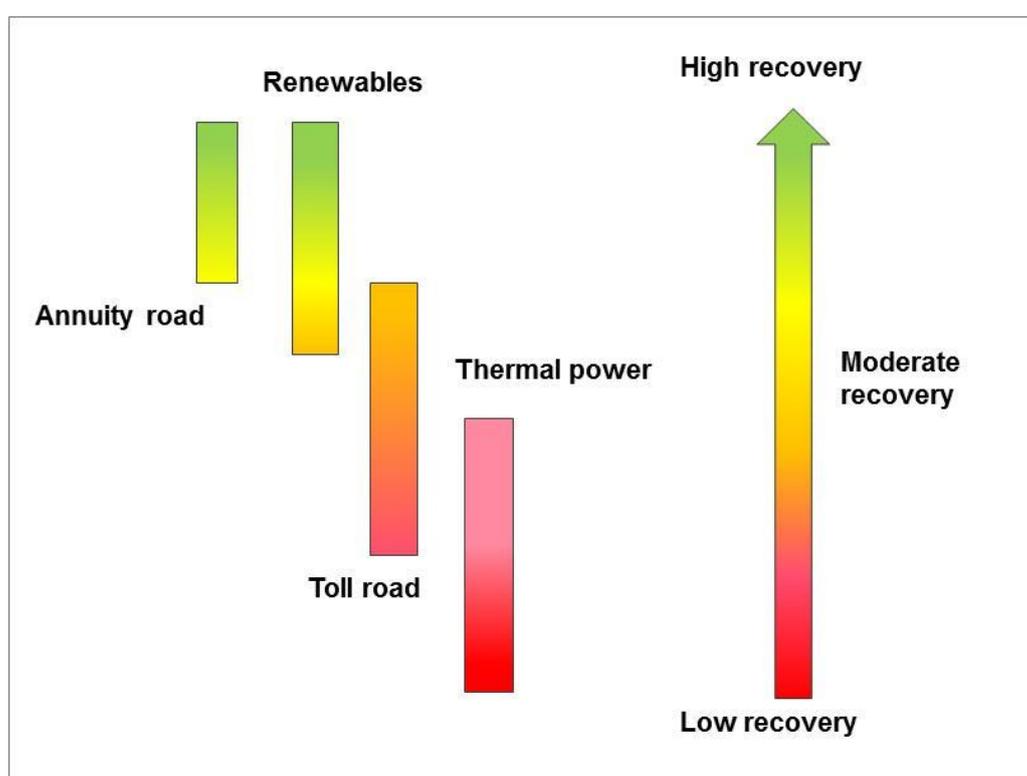
https://www.crisil.com/content/dam/crisil/criteria_methodology/power/crisil-ratings-criteria-for-the-power-sector.pdf

⁵ Default rates are critical inputs in assessing the expected loss. Debt instruments of infrastructure projects have tenures that could range 10-20 years or more. Observed default rates over such long tenures may not be robust, considering constraints on data sufficiency to compute such long term default rates. Hence, CRISIL Ratings extrapolates its observed default and transition rates over medium to longer tenures.

broadly categorized as high, low or moderate depending upon the overall recoverability. While evaluating LGD for a particular debt instrument, CRISIL Ratings considers several scenarios.

1. Cash flow based recovery

This takes into account the extent of debt servicing obligations that can be covered through the cash flows generated from the project. Recovery rate of cash flows for infrastructure projects depends upon various factors such as asset class, project characteristics, and overall project viability. Different asset classes within infrastructure pose different kinds and extents of risk. For example, an annuity road project or transmission project may have a high degree of revenue predictability, but be exposed to escalations in costs. On the other hand power and road projects face both demand as well as cost pressures. These features characteristic of a specific asset play a key role in assessing the recovery rate, or LGD.



The above diagram provides a broad classification of assets with characteristics that tend to result in low or high LGD rates.

For instance annuity road projects have limited uncertainty in revenue inflows owing to the presence of a concessioning authority (typically a government counterparty of good credit quality), and are shielded from demand risk. Hence such projects are expected to have shortfalls in debt servicing largely arising from time delays in receipt/cancellation of annuities, or substantial increase in the cost of maintenance of road projects.

On the other hand, thermal power plants, especially those without power purchase agreements, face revenue risks, apart from other risk factors such as fuel availability, fuel cost, demand, etc.

The inherent risks of asset classes along with dynamics of the projects are some of the crucial factors taken into account for arriving at the extent of recovery of cash flows in servicing debt obligations.

2. Refinancing/restructuring based recovery

Infrastructure projects have long economic lives that is typically longer than the debt tenure. For instance, road projects often have concession agreements of 20-30 years, whereas tenure of the debt/loans generally extend up to 15 years. This leads to cash flow mismatches. However, the residual economic life presents an opportunity for the instruments to be restructured or refinanced over a longer period. Under these circumstances, the additional cash flows over the remaining life of the project can lead to lower losses for investors. Hence in the evaluation of LGD, CRISIL Ratings takes into account the possibility of refinancing, depending on the project characteristics: the residual economic life, the viability of refinancing/restructuring of debt, sustainable level of cash flows, etc.

3. Security based recovery: termination payments etc.

Infrastructure projects may have some form of security that place a ceiling on the losses suffered by the lender/investors. A common form of such security is the termination payment in public private partnership projects for roads, airports, ports, etc. These protect investors/lenders from losses, as the payment for a proportion of outstanding debt is secured by the concessioning authority (typically a government entity as a counterparty) in event the borrower defaults, or during events such as *force majeure*, etc.

However it must be noted that obtaining such terminations may take longer than anticipated. Further, there are limited precedents in the context of Indian infrastructure where termination payments by the concessionaire have been made.

In order to account for such uncertainties, CRISIL Ratings factors in some element of delay in receipt of the termination payments to arrive at LGD based on termination payments etc.

The concession agreements may also have substitution clauses, which enable the lender to opt for the substitution of the concessionaire, and replace it with a management under certain circumstances. Such a step may help shield losses due to exposure to a certain concessionaire. All the above are factored in when arriving at the LGD to be used for a given asset.

V. Conclusion

The EL ratings combine both the pillars of credit risk - PD and LGD - and thus provide a more holistic measure of creditworthiness of an instrument. Infrastructure projects have unique features such as predictability of cash flows over the life of the project, which are better captured through an EL assessment over the life of a debt instrument.

Annexure

Rating scale, definition and indicative loss ranges used prior to changes carried out pursuant to SEBI circular dated July 16, 2021

Rating	Definition	Indicative EL Ranges
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About CRISIL Ratings Limited (A subsidiary of CRISIL Limited)

CRISIL Ratings pioneered the concept of credit rating in India in 1987. With a tradition of independence, analytical rigour and innovation, we set the standards in the credit rating business. We rate the entire range of debt instruments, such as, bank loans, certificates of deposit, commercial paper, non-convertible / convertible / partially convertible bonds and debentures, perpetual bonds, bank hybrid capital instruments, asset-backed and mortgage-backed securities, partial guarantees and other structured debt instruments. We have rated over 33,000 large and mid-scale corporates and financial institutions. We have also instituted several innovations in India in the rating business, including rating municipal bonds, partially guaranteed instruments and infrastructure investment trusts (InvITs).

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