

CRISIL's criteria for rating annuity road projects

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Background

The Government of India has invited private participation in the road construction segment by awarding projects under models such as cash contracts, toll, annuity, and hybrid annuity.

In cash contracts (engineering, procurement, and construction [EPC] contracts), the role of an EPC company is limited to constructing the road and receiving payment from counterparty. It is not exposed to any risk during the post-construction period.

In toll road projects, executed under concession agreements with counterparties (such as the National Highways Authority [NHAI]), a special purpose vehicle (SPV) constructs the road and gets the right to collect toll on it over a concession period. It has an obligation to maintain road quality during that period.

In annuity road projects, the SPV constructs the road and receives the right to receive fixed payments from the NHAI or state government authorities throughout the concession period. It has an obligation to maintain the quality of the road. However, unlike in toll road projects, demand risk here is mitigated by a steady stream of assured payments from the concessioning authority.

Hybrid annuity is a new variant, which combines the features of annuity and EPC nature of work. Of late, focus has shifted to hybrid annuity projects where the concessionaire receives payments during the project implementation phase to fund a certain percentage of the project cost, and also receives annuity payments during the operational phase, which are inflation-adjusted. (*See Box 1 for salient features of Hybrid Annuity Projects*)

This criteria¹ document outlines CRISIL's approach and methodology for rating road projects that receive fixed annuity payment (both annuity and hybrid annuity projects).

Executive summary

Annuity projects are exposed to two kinds of risks in the construction phase – construction risk and funding risk. Construction risk is looked at based on availability of right of way and environment and forest clearances, funding risk looks at the ease of tying up financing and costs incurred, among others.

Operational annuity road projects are insulated from fluctuations in revenue as cash flows to the concessionaire are not linked to the traffic plying – rather, a fixed amount is paid semi-annually as per the concession agreement. So the major residual risk pertains to the costs incurred to maintain the road.

There are two types of costs incurred with respect to operational annuity road projects – operation and maintenance (O&M) expenses, which occur every year, and major maintenance and repair (MMR) costs that typically occur once in five years. Since the cash inflows are stable and outflows predictable, operational annuity road projects are generally have a thin cushion on the debt service coverage ratio (DSCR). This means ability to service debt is highly sensitive to O&M and MMR expenses.

CRISIL's analysis considers adequacy of these costs – mainly MMR – and potential increases therein due to inflation factors. CRISIL evaluates factors such as the quality of road, traffic conditions, and terrain to assess the appropriate level of MMR costs. CRISIL sensitises these costs to inflation factors when assessing whether cash inflow can absorb the impact of unanticipated increases in cost, given the thin cushion on the DSCR.

¹ For accessing previously published document on "CRISIL's Criteria for rating annuity road projects", follow the link: https://www.crisil.com/content/dam/crisil/criteria_methodology/infrastructure/Annuity%20Road%20External%20Criteria_V32.pdf

There is minimal risk associated with non-payment of annuities as the counterparties are typically government or government undertakings. However, there could be delay in annuity payments, which could impact timely servicing of debt instruments. So, CRISIL's analysis also focuses on the adequacy of the liquidity cushion in the form of a debt service reserve account (DSRA) to mitigate the risk of delayed annuity payments.

Scope

The scope of the criteria applies to projects – both annuity and hybrid annuity – that receive fixed annuity payments from both NHAI and state governments.

Rating annuity roads

An annuity road goes through two main stages:

1. Construction (project) stage
2. Operational stage

The methodology for rating in each of these stages is explained below.

Major risks in project stage annuity road projects

For annuity projects that are under implementation and yet to enter the operational phase, the rating factors in project risks (see Table 1)

Table 1: Factors for assessing project risk

Key project risks	Explanation
Implementation risk	Road projects span several kilometres. Hence, factors such as land acquisition, environmental clearances, and delay in contracts may hamper timely implementation. Most clearances and permits are to be sought on an ongoing basis. Terrain complexity also adds to the implementation risk. While segments passing through flat terrain are easier to execute, those located on hills, in forests, and near rivers make execution more complex.
Funding risk	Availability of funding – both debt and equity – is critical for timely project completion.
Technology risk	Technology for construction of roads is well-established.

CRISIL also factors in the track record of the sponsor with regard to timely completion of projects, the post-implementation debt-servicing ability, and liquidity. However, as annuity road projects span long distances, cost overruns and project delays are common. Hence, it is likely that ratings during the project implementation stage would be constrained.

Major risks in operational annuity road projects

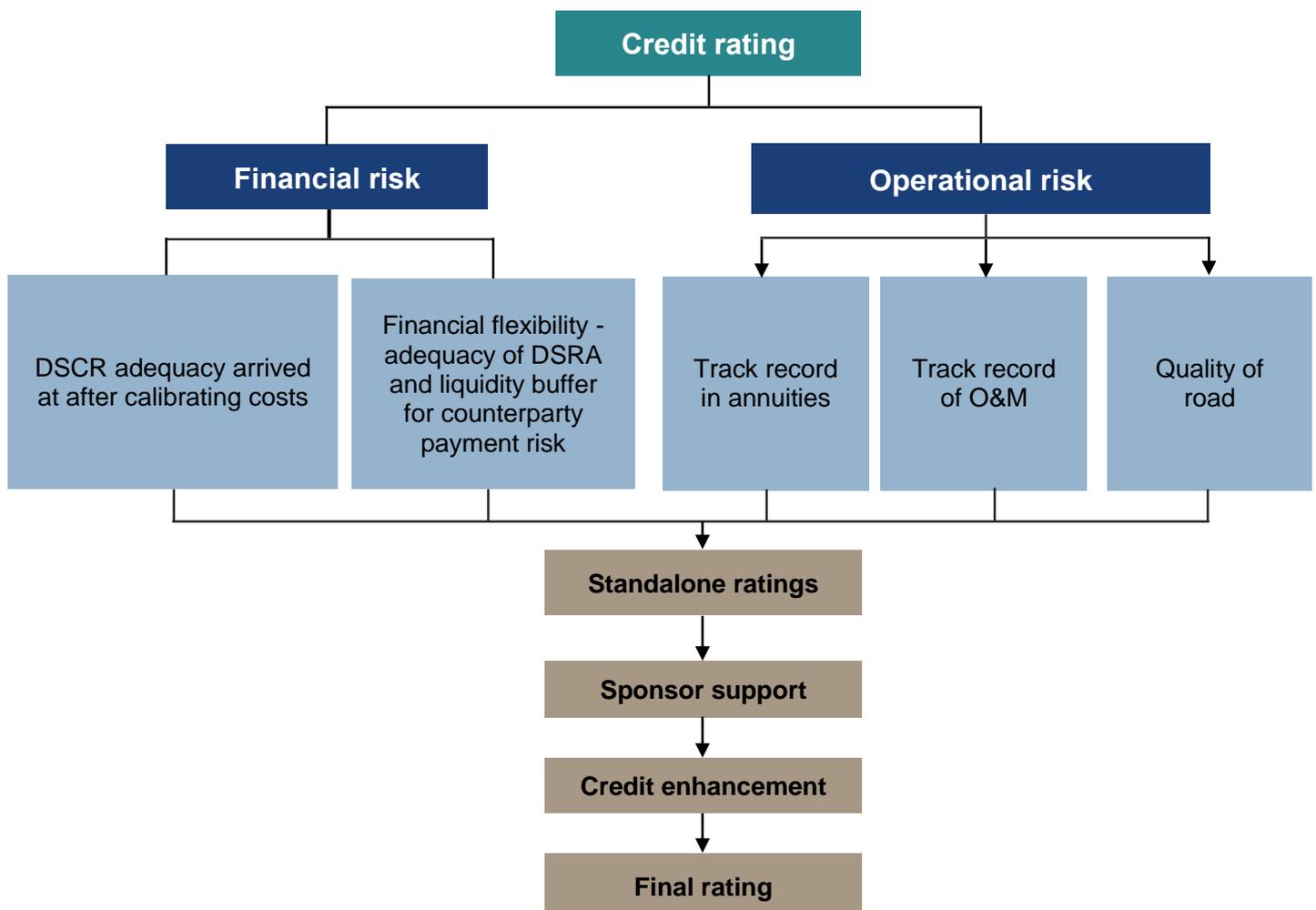
In an annuity road project, there is no demand risk and the project SPV typically gets a fixed semi-annual payment from NHAI or state government entities. Major risk factors in an annuity project are highlighted below:

Annuity road project – overview of risk factors

Demand	No demand risk (fixed semi-annual payments from the NHAI or state governments)
Price	No price risk
Cost	O&M cost of the road with respect to both adequacy and susceptibility to inflation, which can be a drain on cash flow available for debt servicing.
Counterparty	In most cases, the concessioning authority is a government or a public sector entity, so the risk of non-payment is low. However, there may be delay in payment of annuities that could lead to both liquidity mismatches and time-value losses, thereby affecting the ability to service debt on time.

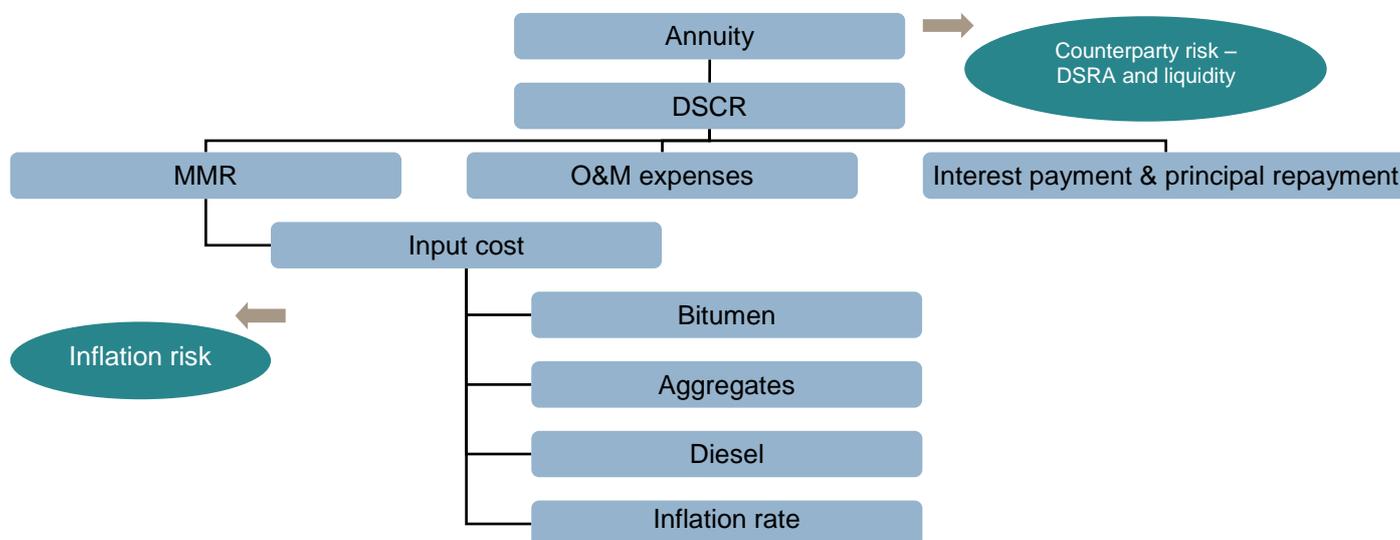
Methodology

Overview of CRISIL methodology for operational annuity road projects



Financial risk

Key components of financial risk



DSCR

Need for an approach to calibrate costs in order to arrive at DSCR

Most operational annuity road projects are SPVs, largely funded by 70-90% debt, repayment of which is primarily through annuity receipts. Since assessment of a project's ability to service its debt is critical to its credit quality, DSCR becomes a key indicator.

The main variable factor (post-construction) in an annuity project is the cost incurred in operating and maintaining the road. This depends on prices of inputs such as bitumen, aggregates, stones, diesel prices, and labour. Any increase in input prices or higher-than-anticipated inflation would affect cash flows available for servicing debt.

Furthermore, if a developer tries to absorb the impact of increased costs on overall cash flows by compromising on road maintenance, the concessioning authority may suspend or delay the annuities till the quality of road is restored to stipulated conditions.

SPVs typically give a maintenance contract to their sponsors for a fixed price (sometimes it could also contain some protection for inflation). However, these costs are often not sufficient to compensate an independent third-party to carry out maintenance activity of acceptable quality. If the costs are not adequately sensitised, the debt instrument's credit quality will display a strong linkage to the sponsor's credit quality. Notably, such debt instruments are usually highly rated, often several categories above the sponsor's.

For effective delinking of the debt instrument's credit quality from the sponsor's credit risk profile, it is important to assess whether the O&M and MMR costs are adequate enough to attract an independent third-party to undertake the maintenance activity, even if the sponsor is replaced.

The O&M and MMR, if sized appropriately, can attract a third-party to undertake maintenance activity profitably and make sure the project remains economically viable on its own. So, CRISIL sensitises maintenance costs, rather than relying only on documented maintenance costs, when computing DSCR. Over the past five years, CRISIL has observed many road developers go through severe stress; and given the long tenure of the concessions, a recurrence of such stress, which could impair overall debt-servicing ability in future, cannot be ignored.

Furthermore, current inflation levels may not adequately reflect the adequacy of cash flow available for debt servicing, in case of higher inflationary conditions in future. This becomes critical as debt in annuity road projects is often structured with a thin cushion in DSCR, and changes in cost estimates could put pressure on the ability to meet debt obligation on time. Hence, at higher rating levels, it is critical to sensitise project cash flows to higher inflation levels when computing DSCRs.

In case of projects where CRISIL deems costs are not sized appropriately, the ratings on the debt instruments may not be delinked completely from the sponsor's credit quality (*while not necessarily capped at the sponsor's credit risk profile, it may be difficult to have ratings beyond two rating categories from the sponsor's credit risk profile*). Furthermore, projects whose sponsors are currently in deep distress may find it difficult to receive ratings in the 'High Safety' or 'Highest Safety' categories from CRISIL.

Components of cost in operational road projects

In an operational annuity road, the major risk is on account of costs to be incurred, which are of two types –

- O&M
- MMR

O&M costs

These are routine costs incurred every year and are related to normal wear and tear of a road. O&M involves repairing patches damaged mainly due to heavy traffic movement. The primary purpose is to maintain the road as per specifications. This cost typically constitutes 4-10% of the total cost over the life of the project.

MMR costs

The MMR cost is typically incurred once in 5-7 years. These expenses are primarily related to construction/relaying of the top layer of the road, and thus involve considerable amounts of material and labour. Hence, MMR cost moves in tandem with the cost of the construction of a new road. This typically constitutes 25-40% of the total cost over the life of the project.

Methodology for computing DSCR – arriving at cash flow available for debt servicing after calibration of costs

CRISIL's framework in annuity road projects primarily focuses on two key aspects while calibrating the costs to arrive at cash flow for computation of DSCR:

- Estimating adequacy of MMR and O&M costs
- Application of inflation rates/ factors

Adequacy of MMR and O&M costs

CRISIL has observed a wide variance in MMR costs, ranging from Rs 4 million to 10 million per km for a four-lane NHAI project. O&M costs tend to be in the Rs 0.3-0.8 million range per year.

CRISIL evaluates various factors to assess the quality of the road condition in order to determine the adequacy of MMR and O&M costs. In projects where lower MMR and O&M costs are budgeted, these costs are appropriately sized and factored in to arrive at the overall DSCR. For state road projects where traffic flow is relatively lower than on national highways, the wear and tear of roads is lower and usually entails lower MMR and O&M costs. CRISIL also factors that high quality roads may be able to reduce the frequency of MMR, or use emerging technologies such as micro-surfacing to carry out the MMR at a later stage.

Factors taken into consideration for determining the adequacy of MMR and O&M costs

Key factors	Explanation
Traffic	<p>The wear and tear and thus, the frequency and intensity of maintenance depends on the nature and number of vehicles traversing the given stretch. A quantitative measure of the same, which also offers a degree of comparability, is traffic measured in million standard axles.</p> <p>CRISIL also estimates the ability of a road to withstand increased traffic based on growth trends observed in traffic conditions. Where traffic growth is higher than anticipated, there is a risk of the road requiring a structural overlay. This, in turn, could significantly increase costs.</p> <p>CRISIL evaluates these conditions and factors higher MMR and O&M costs to assess an entity's debt servicing ability.</p>
Quality	<p>Road quality is a critical parameter assessed by an independent engineer of the concessioning authority at regular intervals. Projects that are not maintained as per requirements would need higher cash outflow to ensure serviceability. Moreover, if roads are not maintained as per prescribed conditions, there is significant risk of delay or reduction in annuity payments.</p> <p>To assess the quality of roads, CRISIL considers the results of the following tests:</p> <ol style="list-style-type: none"> 1. Characteristic deflection test and, 2. Roughness by bump integrator test <p>Characteristic deflection test</p> <p>This is a measure of the structural strength of the road and is carried out annually. The test values are expected to be between 0.5-0.8 millimetres (mm) at the time of operations. Lower values indicate superior quality road, while higher values indicate a road of low structural strength. At the time of commencement of operations, values at the lower end of the range are considered acceptable and are expected to increase with wear and tear.</p> <p>Roughness by bump integrator test</p> <p>This test measures the roughness of the road surface. The test values vary from 1,800-3,000 mm per km. Higher values indicate the roads could deteriorate soon and may need to be taken up for major maintenance earlier than anticipated. Hence, lower values are considered desirable.</p> <p>CRISIL evaluates these factors periodically. Any significant change in operating conditions on account of road quality are factored into the rating.</p>
Freight intensive zones	<p>Roads operating in freight-intensive zones such as mining areas are frequently subject to overloading, which adds to their deterioration despite lower traffic. Furthermore, presence of heavy commercial vehicles contributes to an increase in vehicle damage factor, thereby accelerating deterioration in structural quality if not adequately maintained. CRISIL takes into account operating conditions and presence in freight intensive zones as critical factors when evaluating the adequacy of MMR costs. Presence in freight-intensive zones is factored negatively and expected to increase MMR costs, if not adequately provided for.</p>
Terrain	<p>The terrain which the stretch of road is going to be exposed to is a critical input in determining maintenance costs. In case the road is present in zones of high precipitation, either due to heavy rainfall or frost, there is a greater chance of moisture percolating to the bituminous layer and causing damage due to cracks. Thus, roads in rough terrain are likely to be subject to higher wear and tear and may need special maintenance. Presence of structures like bridges and culverts on a road can also increase MMR and O&M costs.</p>
Profile of the developer	<p>The profile and track record of the developer in managing multiple operational road stretches indicate the ability to take corrective action in case the road shows early signs of deterioration. A strong credit risk profile enables the developer to absorb the impact of these unanticipated rise in costs. Hence, projects belonging to such developers can be considered a positive factor.</p>

Calibration of costs to inflation

CRISIL's analysis not only covers the adequacy of the budgeted MMR and O&M costs but also the changes in key cost factors such as bitumen, aggregates and diesel, and labour (inflation); which could impact the debt servicing ability of the SPV.

CRISIL has analysed the historical data for these commodity prices and inflation rates for the past two decades and observed wide variations, underscoring their importance as an input for the rating.

In operational annuity road projects, cash inflows are highly stable, since these are independent of the price and demand risk, and depend solely on receipts from a typically strong counterparty such as the NHAI. Further, the outflows are predictable, involving small amounts incurred as O&M expenses each year and a major maintenance cost to overlay the top layer of the road once every five to seven years. Thus, these projects are structured with thin DSCRs. Given this, the sensitivity to inflation rates is significant since small changes in cost can lead to fluctuations in the DSCR. This necessitates centrally factoring in inflation rates and stressing the cash flows for increase in inflation. CRISIL factors in that a high-quality road built and maintained may be able to postpone major maintenance in high cost for years, and thus may not be necessarily exposed to the full extent of volatility in inputs costs.

A higher rating signifies greater stability and ability to absorb shocks, and should be able to withstand higher stress.

Financial flexibility: Creation of adequate DSRA to mitigate counterparty payment delay risk

Need for DSRA

In an operational annuity project, timely repayment of debt depends on steady receipt of annuities from the concessioning authority. Since the concessioning authority is generally a government or a government-controlled entity, the risk of incomplete payments is minimal and hence solvency is rarely an issue. However, there could be delays in receipt of annuity payments, which could adversely affect the borrower's ability to repay on time. Hence, it is critical that the borrower maintains a liquidity cushion to mitigate impact on timely debt servicing.

The DSRA usually acts as a buffer for use in times of delayed payment from the concessioning authority.

CRISIL also considers the strength of the counterparty in deciding adequate liquidity levels. For instance, the NHAI has a better track record with respect to timely payment of annuities. Also, there is differentiation among state governments based on payment track record, credit risk profile, among others.

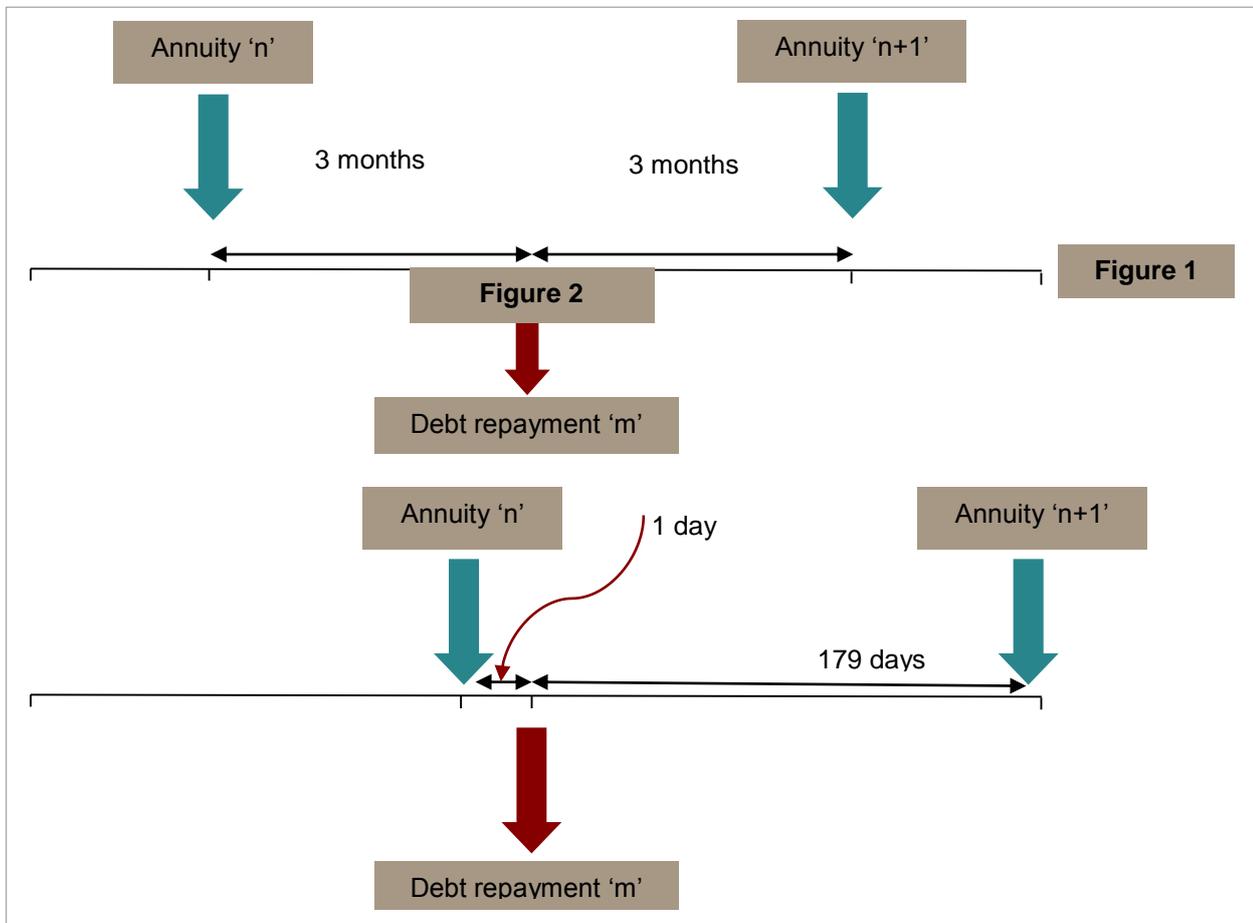
However, even in situations where the counterparty credit profile is extremely strong, there could be delays in timely receipt of annuity payment. For instance, in a sample of 24 NHAI annuity road projects, with 88 observations of semi-annual annuity payments (*Source: NHAI Website*), it was observed that the delays exceeded 60 days² in 10% of the observations, though it hardly exceeded 5 days for the majority.

This further underscores the importance of DSRA to provide a cushion in the event of delays.

The DSRA requirements increase at higher rating categories for entities with similar counterparty credit profiles. On the other hand, the weaker the counterparty credit profile the higher is the DSRA requirement for entities in similar rating categories. Projects that do not have such a liquidity facility/DSRA are usually not consistent with 'AA' or 'AAA' ratings.

² It is likely that such delays may be caused due to withholding of annuity payments by the NHAI due to shortfall in performance obligations of the concessionaire.

Another important aspect in financial flexibility is the structuring of debt repayments vis-à-vis the receipt of annuity payments. If the structuring is such that there is a large gap between the receipt of annuity payments and debt repayment, then the overall liquidity requirements may be lower (Figure 1). Conversely, if the debt repayments are structured close to the annuity payments, then the debt repayment becomes highly sensitive to even small delays, and this increases the DSRA requirement (Figure 2).



CRISIL also evaluates whether the liquidity/DSRA is maintained in the form of cash or bank guarantee. DSRA maintained in cash is considered to be an advantage over bank guarantees where there is a counter guarantee provided by the SPV.

Where the counterparty to bank guarantee is the SPV, in the event the bank guarantee is invoked by lenders for meeting shortfalls in repayment, the issuing bank would recover the amount from the SPV. The SPV is liable to make these payments, failing which it would be construed as default and lead to a sharp deterioration in the credit profile of the SPV.

If the guarantee invocation needs to be steered by an entity which is not the SPV, and the guarantee is unconditional, this risk is partially mitigated.

While considering bank guarantee in the form of DSRA, CRISIL also evaluates the credit profile of the bank providing the guarantee.

CRISIL would consider the quantum of the liquidity facility and the DSCR as key inputs in arriving at the overall rating.

Operational risk

Track record of receipt of annuities

It has been observed in several annuity projects that the entity has to obtain certifications from various authorities to achieve the project commercial operations date. Delays resulting from these procedural aspects can also push back receipt of annuity payments from the concessioning authority. It is only post receipt of 2-3 annuity payments that the process tends to stabilise. Hence, a track record of timely receipt of annuities becomes a critical factor in evaluating these operational annuity road projects.

Track record of O&M

CRISIL looks at whether the required O&M expenses have been incurred towards maintenance of the road stretch. Any shortfall in O&M can lead to additional wear and tear, thereby affecting its quality. Besides, this may also lead to a breach of the terms of the concession agreement, leading to non-receipt of annuity payment. A sustained track record of O&M is, therefore, critical.

Sponsor track record in managing operational road stretches

CRISIL looks at the history of the sponsor in managing operational stretches. A consistent track record indicates ability to undertake the required O&M and maintain the road as per the agreed requirements. This also highlights the sponsor's ability and willingness to absorb any unforeseen expenses/losses and keep the project operational. Furthermore, CRISIL looks at the creditworthiness of the sponsor managing the operational road annuity projects. Sponsors with weak credit profiles or those having projects that are under financial stress are a critical factor in evaluating the credit profiles of operational annuity road projects, especially in higher rating categories.

- **Management risk**

CRISIL's evaluation involves assessment of the management in three broad categories: integrity, risk appetite, and competency. For details please refer to CRISIL's article titled 'Rating Criteria for Manufacturing Companies' available on www.crisil.com.

- **Credit enhancement**

Credit enhancement in the form of guarantee or other tools may be factored appropriately in the rating.

- **Sponsor support**

Sponsor support refers to financial support from a creditworthy sponsor to account for any delay in annuity or liquidity crunch. CRISIL analyses the possibility of sponsor support based on the past track record of supporting projects, credit profile of the sponsor, and whether it is economically beneficial for the sponsor to support the SPV and to what extent, besides the status of other projects which have the same sponsor.

Box 1: Hybrid annuity model (HAM)

CRISIL's framework for the analysis of hybrid annuity model roads is largely similar to that used for the analysis of annuity roads. However, there are a number of contractual features in HAM roads that reduce the overall risks in both construction as well as operational phases.

In HAM, the NHAI provides 40% of the construction cost during the project stage. This reduces the funding risk on account of lower equity to be brought by the developer during the initial stage. The remaining cost is provided by the NHAI using a fixed stream of annuity payments over the concession period.

HAM projects are partially insulated from fluctuations in cost overruns during the project phase. Further, in the event of delays in hand over of the required right of way by NHAI, the concession agreements in HAM stipulate the reduction in project scope to the extent of right of way provided by NHAI. Moreover, in such instances, the projects are eligible for completion and receipt of proportionate annuity payments based on the reduced scope of the project. This feature minimises the risk of delay in project completion which in road projects arises primarily due to land acquisition issues.

Similarly, during the operational phase, maintenance payments received from the NHAI are inflation-linked and protect the developers from increase in cost up to a certain level. Thus, risk to the developer due to inflation or increase in costs is significantly reduced. Additionally, the NHAI provides interest on remaining annuities (*linked to benchmark rate*), which protects the developer in case of significant increase in interest costs.

Other key factors that have a bearing on the overall credit quality in HAM road projects include the strength of the developer and the extent of aggression in the bid. The developer's strength comes into prominence as both the NHAI milestone payments during the construction phase and annuities during the operational phase are contingent upon the developer constructing and maintaining the projects as per NHAI specifications. Bid aggression is no less important because compensation for inflation by the NHAI is only to the extent of bids submitted, in case of both project and maintenance costs. In the event of aggressive bidding resulting in a substantial difference between the actual project cost and maintenance cost versus the bid project costs, the developer shall remain exposed to the risk of cost increases for the remaining portion of costs not covered in the concession agreement.

Conclusion

CRISIL's rating methodology for annuity projects involves extensive analysis of all the risk factors pertaining to these projects. The analysis focuses primarily on the adequacy of maintenance costs and a thorough analysis of the quality of the road. The rating methodology, further, takes into account the liquidity cushion maintained to mitigate the risks arising from delayed annuity payments. In addition, CRISIL may factor in parent/ group support or external credit enhancements in the form of guarantees (partial or full) while assigning ratings to the debt instruments. The criteria for parent/group support and for evaluating partial guarantee instruments are covered under other articles on CRISIL's website.

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