LLCR DEFINITION
LOAN LIFE COVER RATIO –

LLCR Introduction

The Loan Life Cover Ratio ("LLCR") is one of the most commonly used debt metrics in Project Finance. It provides an analyst with a measure of the number of times the cashflow over the scheduled life of the loan can repay the outstanding debt balance.

The LLCR ratio can also be interpreted as an asset to liability ratio.

How many times more than the senior debt liability is the projects asset base (on a discounted basis), are the operational cashflows?

LLCR Example 1

An LLCR of 2.00x means that the Cashflow Available for Debt Service ("CFADS"), on a discounted basis, is double the amount of the outstanding debt balance.

Example 2

An LLCR of 1.00x means that the CFADS, on a discounted basis, is exactly equal to the amount of the outstanding debt balance. The movement of a key variable to achieve an LLCR of 1.00x is an important measure of the strength of the project economics, often referred to as the 'LLCR break-even'. A typical example is analysis of a toll road where the analysis could be 'the project achieves a break-even LLCR at 38% reduction of patronage from the Base Case'. In comparison the DSCR breakeven might only be 20%.

Definition of LLCR

Generally the LLCR is calculated as:

LLCR = NPV [CFADS over Loan Life] / Debt Balance b/f

The Discount Rate used in the NPV calculation is usually the Cost of Debt, also known as the Weighted Average Cost of Debt.

Variations in LLCR Definition

From time to time Borrowers request and Lenders allow other 'assets' to be either included in the numerator or excluded from the denominator to reflect instances where there will be other cash deposits available to the lender in the event of default rather than just the NPV of the Cashflow.

For example it is not uncommon to find the balance of the project's cash account, or the Debt Service Reserve Account ('DSRA') added to the numerator or netted from the numerator. Extreme caution needs to be applied when assessing the economics of a project where the LLCR is supported with cash account balances

When DSRA is included, the LLCR shall then be calculated as:

LLCR = (NPV [CFADS over Loan Life] + DSRA/c Balance b/f) / Debt Balance b/f

LLCR Calculation

The LLCR does not pick up weak periods as it essentially represents a discounted average. For this reason, if the Project has steady cashflows with Credit Foncier repayment, a good rule of thumb is that the LLCR should be roughly equal to the average DSCR.

> "Transparent and accurate modelling of the LLCR is fundamental in Project Finance. If you are seeking further clarification on LLCR related issues then you should attend our Project Finance Modelling (A) course."
>
> Nick Crawley, Managing Director
> Navigator Project Finance

The example below illustrates a Project with a steady CFADS and Credit Foncier repayment. The example illustrates that the average DSCR is very close to the LLCR's in this situation.

		Jan-09	Jan-10	Jan-11
Period Start				
Period End		Dec-09	Dec-10	Dec-11
Construction				
Operations				
LLCR				
Cost of Debt "r"		8.00%	8.00%	8.00%
"1+r"		1.08	1.08	1.08
Numerator				
CFADS	@ Period End	100.50	100.00	101.00
CFADS (Qualifying)	@ Period End	100.50	100.00	101.00
NPV (CFADS)	@ Period Start	332.84	258.96	179.68
Denominator				
Debt Balance B/f		200.00	155.62	107.68
LLCR	@ Period Start	1.66 x	1.66 x	1.67 x
DSCR				
Numerator				
CFADS		100.50	100.00	101.00
Denominator				
Interest		16.00	12.45	8.61
Principal		44.38	47.93	51.77
Total Debt Service		60.38	60.38	60.38
	Average			
DSCR	1.66 x	1.66 x	1.66 x	1.67 x

Average DSCR is very close to the LLCR

Screenshot #1: Example of LLCR and DSCR calculation

Common Errors and Oversights made when Modelling the LLCR

Algebraically the LLCR is a simple calculation, however it is also a calculation which is prone to error. Below are some of the frequently encountered mistakes:

- The NPV in the numerator has not calculated with the wrong base time so the LLCR values are all on different 'time basis'.

- Incorrect use of the (X)NPV function in Excel.

- The discount rate has not been calculated as cost of debt, which includes interest and margin (and if appropriate PRI).

- The Discount Rate, which is usually the 'Average Cost of Debt' is overcomplicated rather than calculated simply as:

    <Cost of Debt> = Total Interest (for all tranches) / Total Debt Balance B/f (for all tranches)

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- Debt Modelling Masterclass
- VBA for Financiers

- The formulas are too complicated making them hard to edit if the definition requires variation or to validate.

- The definition of the LLCR in the model is not clear and has not been validated against the debt term sheet.

- LLCR covenants are used to trigger cash sweeps, while at the same time including interest on reserve accounts / cash balances in the model resulting in a circular model.

- The inclusion of CFADS has not been correctly capped at the end of the loan life.

- CFADS has not been clearly presented in the cash waterfall and the LLCR is incorrectly referring to some other line in the waterfall.

- The discounting of CFADS is calculated incorrectly by confusing compound/simple interest rates.

- Adjustment has not been made and an annual discount rate is being applied to quarterly cashflows, or vice versa.

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Caution needs to be applied when adding the DSRA/c Balance B/f into the numerator. Remember that the DSRA/c Balance shall be added to the NPV (CFADS) line, and not to be discounted as in CFADS. This clause must be carefully checked in the definition of LLCR in the Term Sheet.

Checking the Calculation of LLCR

Some good rules of thumb to check if LLCT has been calculated correctly:

- For steady cashflows with a Credit Foncier repayment the Average DSCR should be very close to the LLCR.

    This is a good rule of thumb to cross-check the LLCR and/or the average DSCR. This is not always the case especially in highly sculpted or exotic repayment scenarios.

- If CFADS is constant throughout and a Credit Foncier repayment is being adopted, then the calculated LLCR should also be constant.

    Please refer to the Screenshot #2, where the CFADS is USD 100 Million throughout and the Credit Foncier repayment is adopted. The LLCR is 1.66x throughout.

Period Start		Jan-09	Jan-10	Jan-11
Period End		Dec-09	Dec-10	Dec-11
Construction				
Operations				
LLCR				
Cost of Debt "r"		8.00%	8.00%	8.00%
"1+r"		1.08	1.08	1.08
Numerator				
CFADS	@ Period End	100.00	100.00	100.00
CFADS (Qualifying)	@ Period End	100.00	100.00	100.00
NPV (CFADS)	@ Period Start	331.21	257.71	178.33
Denominator				
Debt Balance B/f		200.00	155.62	107.68
LLCR	@ Period Start	1.66 x	1.66 x	1.66 x
DSCR				
Numerator				
CFADS		100.00	100.00	100.00
Denominator				
Interest		16.00	12.45	8.61
Principal		44.38	47.93	51.77
Total Debt Service		60.38	60.38	60.38
	Average			
DSCR	1.66 x	1.66 x	1.66 x	1.66 x

Screenshot #2: Example of constant LLCR

This is a Free Tutorial from Navigator Project Finance. If you have any feedback or suggestions for future developments we would like to hear from you!

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Founded in 2004, Navigator Project Finance Pty Ltd (Navigator) is the project finance modelling expert. Headquartered in Sydney, Australia, Navigator is raising the global benchmark in financial modelling services to the project finance sector. Navigator designs and constructs financial models for complex project financings, offers training courses throughout the Middle East, Asia and Europe, and conducts independent model reviews of project finance transaction models. Navigator delivers fast, flexible and rigorously-tested project finance services that provide unparalleled transparency and ease of use.

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Navigator Project Finance Pty Ltd   P +61 2 9229 7400   E enquiry@navigatorPF.com

www.navigatorPF.com