JULIAN R. STERLING

Real Estate Modeling

Underwrite, Develop and Share the Profits of a Commercial Property

Course Book

Eight modules, one running case, every figure computed.

Educational material. Not investment advice. Prepared with AI assistance.

MODULE 4

Debt: LTV, DSCR, debt yield and loan sizing

Objectives

- Compute loan-to-value, debt service coverage and debt yield, and say what each one protects the lender against.
- Size a loan as the smallest of the three limits.
- Compute the debt constant and the payment of an amortizing loan, with an interest-only period.
- Read the coverage path over the hold and find the year the loan is tightest.

A commercial mortgage lender asks three questions. How much of the value am I lending (loan-to-value, LTV)? Does the income pay the debt service with a margin (debt service coverage ratio, DSCR)? What yield would I earn on my loan if I took the building back (debt yield)? Each question becomes a limit, and the loan is the smallest of the three.

Ratio	Formula	Protects against	Running case policy
Loan-to-value	Loan / value	A fall in value	At most 60%
DSCR	NOI / annual debt service	A fall in income	At least 1.30x
Debt yield	NOI / loan	Low rates and cap rates inflating the loan	At least 8.0%

Debt constant

The DSCR limit depends on the payment. A 6.00% loan amortizing over 30 years with annual payments has a debt constant of 7.265%: each year it costs 7.265% of the original loan, interest and principal together. Lenders size on the amortizing payment even when the loan starts interest only, because the building has to carry the payment once amortization starts.

The three limits on Building A

Limit	Calculation	Maximum loan
Loan-to-value	60% x $45.5m	$27.30m
DSCR	$2.388m / (1.30x x 7.265%)	$25.28m
Debt yield	$2.388m / 8.0%	$29.85m

DSCR binds: the loan is $25.28m, 55.6% of the price. At a 5.25% cap rate and a 6.00% rate, the income cannot carry a 60% loan. DSCR binds whenever the cap rate is below DSCR x LTV x debt constant (1.30x x 60% x 7.265% = 5.67% here); the debt yield binds instead when its floor exceeds DSCR x debt constant (9.44%). In today's market of cap rates near or below the cost of debt, LTV is often not the binding limit.

The coverage path

During the 3 interest-only years the debt service is $1,517k and the DSCR 1.57x in year 1. Amortization starts in year 4, the payment rises to $1,837k, and that is exactly the year Cobalt Home Goods rolls: NOI dips and the DSCR falls to 1.21x, below the 1.30x used for sizing. A loan with a cash management trigger at 1.25x would trap cash that year. Lowest DSCR over the hold: 1.21x.

Worked example, step by step

1. Debt constant: 6.00% / (1 - 1.06^-30) = 7.2649%.
2. Limits: LTV $27.30m, DSCR $25.28m, debt yield $29.85m. The loan is the smallest: $25.28m.
3. Resulting ratios at closing: LTV 55.56%, debt yield 9.44%, DSCR on the amortizing payment 1.30x.
4. Loan fee 1.0%: $252.8k. Equity at closing: $46.182m + $0.253m - $25.281m = $21.154m.
5. NOI can fall 23.1% from year 1 before it no longer covers the amortizing payment (DSCR of 1.00x).

Pitfalls

- Sizing the DSCR on the interest-only payment: the loan will amortize, and the coverage falls when it does.
- Reading a low LTV as a safe loan: when DSCR binds, the coverage is the tight ratio, not the value cushion.
- Testing DSCR only in year 1: rollovers and the start of amortization can coincide, as in year 4 here.
- Computing the debt yield on value instead of on the loan.

Summary

- LTV protects against value, DSCR against income, debt yield against cheap money inflating the loan.
- The loan is the smallest limit: $25.28m here, set by DSCR, 55.6% of the price.
- Debt constant of a 30-year, 6.00% loan: 7.265%.
- Coverage is tightest in year 4 (1.21x), when amortization starts and a lease rolls.

In the Exercise Workbook: tab M4 Debt: debt constant, the three limits and the coverage path.

Practice questions

4.1 What is the maximum loan from a 60% loan-to-value limit?

A. $27.30m

B. $30.02m

C. $41.39m

D. $27.71m

4.2 Why do lenders size DSCR on the amortizing payment even during an interest-only period?

A. To raise the loan amount

B. Because interest-only loans are illegal

C. Because NOI falls every year

D. The property must carry the payment once amortization starts

4.3 Loan-to-value is measured on:

A. Equity

B. NOI

C. Total cost including closing costs

D. Value (price or appraised value)