Debt Service Coverage Ratio (DSCR) Calculations and Examples

This document provides product-specific information and sample calculations for the debt service coverage ratio that is disclosed for each property underlying Fannie Mae multifamily MBS.

Actual Debt Service Coverage Ratio

Actual DSCR is the ratio of Underwritten Net Operating Income (UW NOI) to the annualized debt service.

\[ \text{UW NOI} = \text{Underwritten Effective Gross Income less Underwritten Total Expenses (including Replacement Reserves)} \]

\[ \text{Annualized Debt Service} = \]

- For full and partial interest-only, 30/360, and Actual/360 loans, the Initial Interest Rate multiplied by Actual Unpaid Principal Balance at Acquisition.
- For amortizing 30/360 and Actual/360 loans, the monthly payment (can be found published in the Note) multiplied by 12.

Product Variations

Partial and Full Interest-Only (IO) Loans: The calculation does not include amortization.

ARM Loans: The calculation will be based on the Initial Interest Rate.

Cooperatives: UW NOI = Actual Cooperative NOI Effective Gross Income less Underwritten Total Expenses (including Replacement Reserves).

Supplemental Mortgages & Loans with Subordinate Debt (Combined) or Additional Debt (Combined): The ratio of UW NOI to the annualized combined monthly payments of all existing loans. Combined monthly payments = the combined current monthly payments for all supplemental, subordinate debt, and first liens (does not include soft debt, mezzanine debt or preferred equity). If the additional debt is partial IO and is still in its IO period, then the IO payment is used. If the additional debt is partial IO and is in its amortization period, then the amortizing payment is used.

DSCR at Maximum Payment

DSCR at Maximum Payment is the ratio of UW NOI to the debt service calculated as described below.

Product Variations

Partial Interest-Only Loans: DSCR = UW NOI / annualized partial interest-only amortizing payment.

ARM Loans: DSCR = UW NOI / annualized monthly payment calculated using the maximum lifetime interest rate, if applicable, for ARMs with an embedded cap, or the variable underwriting rate for other ARMs (e.g., Structured ARM) with an amortization factor. No amortization factor is used for full interest-only ARM loans.

Fixed Rate Full Interest-Only Loans: DSCR at Maximum Payment will be the same as the Actual DSCR.

Fixed Rate Amortizing Loans with no Interest-Only Period: DSCR at Maximum Payment will be the same as the Actual DSCR.
Cooperatives: UW NOI = Rental Equivalent NOI Effective Gross Income less Underwritten Total Expenses (including Replacement Reserves).

Supplemental Mortgages & Loans with Subordinate Debt (Combined) or Additional Debt (Combined): The ratio of UW NOI to the annualized combined monthly payments of all existing loans. Combined monthly payments = the combined current monthly payments for all supplemental, subordinate debt, and first liens (does not include soft debt, mezzanine debt or preferred equity). If the additional debt is partial IO and is still in its IO period, then the IO payment is used. If the additional debt is partial IO and is in its amortization period, then the amortizing payment is used.

Sample Calculations
Select Product Type to navigate to the example reflected in the table.

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**Fixed Rate Amortizing Loan**
Loan Amount: $10,000,000
Interest Rate: 5.00%
Term: 120
Amortization: 360
UW NOI: $1,000,000
Debt Service: $53,682, annualized $644,184
**Actual DSCR:** 1.55 = $1,000,000 / $644,184
**DSCR at Maximum Payment:** 1.55
Fixed Rate Amortizing Loan (Cooperative)

Loan Amount: $10,000,000
Interest Rate: 5.00%
Term: 120
Amortization: 360
Actual Cooperative NOI: $750,000
Rental Equivalent NOI: $1,000,000
Debt Service: $53,682, annualized $644,184

Actual DSCR: 1.16 = $750,000 (Actual Cooperative NOI) / $644,184
DSCR at Maximum Payment: 1.55 = $1,000,000 (Rental Equivalent NOI) / $644,184

Fixed Rate Full Interest-Only Loan

Loan: $10,000,000
Interest Rate: 5.00%
Fixed Rate
Term: 120
Amortization: 0
UW NOI: $1,000,000
Debt Service: $10,000,000 * 5.00% (.0500) = $500,000

Actual DSCR: 2.00 = $1,000,000 / $500,000
DSCR at Maximum Payment: 2.00

Fixed Rate Partial Interest-Only Loan

Loan: $10,000,000
Interest Rate: 5.00%
Term: 120
Actual 360
Partial Interest-Only: 12 months
Original Amortization: 0
Amortization: 360
UW NOI: $1,000,000
Debt Service: $10,000,000 * 5.00% (.0500) = $500,000
Amortizing Debt Service: $53,682, annualized $644,184

Actual DSCR: 2.00 = $1,000,000 / $500,000
DSCR at Maximum Payment: 1.55 = $1,000,000 / $644,184
ARM Loan – Embedded Cap

Loan: $10,000,000
Initial Interest Rate: 5.00% (e.g. Margin + Libor Rate)
Amortization: 360
Lifetime Max Interest Rate/Ceiling: 8.00%
UW NOI: $1,000,000
Debt Service using initial interest rate: $53,682, annualized $644,184
Debt Service using lifetime max interest rate: $73,377, annualized $880,524

**Actual DSCR:** 1.55 = $1,000,000 / $644,184

**DSCR at Maximum Payment:** 1.14 = $1,000,000 / $880,524

Structured ARM Loan

Loan: $12,500,000
Initial Interest Rate: 2.770% (e.g. Margin + Libor Rate)
Variable Underwriting Rate: 5.77% (e.g. Initial Interest Rate + Underwriting spread + Cap Cost)
Applicable Fixed Rate for Same Term Mortgage: 4.95%
Term: 120 months
Amortization: 360 months, using a straight line over the loan term based on the Applicable Fixed Rate
Fixed Principal Payment: $18,655
Lifetme Max Interest Rate/Ceiling: None
Underwritten NOI: $1,000,000
Debt Service using initial interest rate: Interest ($12,500,000 * 2.770% (.02770) / 12 = $28,854) plus Fixed Principal ($18,655) equals $47,509, annualized $570,108
Debt Service using variable underwriting rate: Interest ($12,500,000 * 5.77% (.0577) / 12 = $60,104) plus Fixed Principal ($18,655) equals $78,759, annualized $945,108

**Actual DSCR:** 1.75 = $1,000,000 / $570,108

**DSCR at Maximum Payment:** 1.06 = $1,000,000 / $945,108

It is possible for the DSCR at Maximum Payment to be less than 1.0 due to differences in the interest rates used to calculate the principal payment and the interest due.
Structured ARM Loan –Partial Interest-Only

Loan: $12,500,000
Initial Interest Rate: 2.770% (e.g. Margin + Libor Rate)
Variable Underwriting Rate: 5.77% (e.g. Initial Interest Rate + Underwriting spread + Cap Cost)
Applicable Fixed Rate for same term mortgage: 4.95%
Term: 120 months
Amortization: 360 months
Fixed Principal Payment: $18,655
Lifetime Max Interest Rate/Ceiling: None
Underwriting NOI: $1,000,000
Debt Service using initial interest rate: Interest $12,500,000 * 2.770% (.0277) = $346,250
Debt Service using variable underwriting rate: Interest ($12,500,000 * 5.77% (.0577) / 12 = $60,104) plus Fixed Principal ($18,655) equals $78,759, annualized $945,108
**Actual DSCR:** 2.89 = $1,000,000 / $346,250

**DSCR at Maximum Payment:** 1.06 = $1,000,000 / $945,108

It is possible for the DSCR at Maximum Payment to be less than 1.0 due to differences in the interest rates used to calculate the principal payment and the interest due.

Structured ARM Loan –Full Interest-Only

Loan: $12,500,000
Initial Interest Rate: 2.770% (e.g. Margin + Libor Rate)
Variable Underwriting Rate: 5.77% (e.g. Initial Interest Rate + Underwriting Spread + Cap Cost)
Applicable Fixed Rate for same term mortgage: 4.95%
Term: 120 months
Amortization: 360 months
Fixed Principal Payment: None
Lifetime Max Interest Rate/Ceiling: None
Underwriting NOI: $1,000,000
Debt Service using initial interest rate: Interest $12,500,000 * 2.770% (.0277) = $346,250
Debt Service using variable underwriting rate: Interest $12,500,000 * 5.77% (.0577) = $721,250
**Actual DSCR:** 2.89 = $1,000,000 / $346,250

**DSCR at Maximum Payment:** 1.39 = $1,000,000 / $721,250

It is possible for the DSCR at Maximum Payment to be less than 1.0 due to differences in the interest rates used to calculate the principal payment and the interest due.
Please Note
For more information please refer to Fannie Mae’s Multifamily MBS Prospectus. Specific definitions for terms can also be found in the Multifamily Securities Locator Service Glossary.