Learning Module 19: Mortgage-Backed Security (MBS) Instrument and Market Features

Fixed Income

Table of contents

Download Files

Download PDF | Download Word |

Loan-to-Value Ratio (LTV)

$$\text{LTV} = \frac{\text{Loan Amount}}{\text{House Price}}$$

- The ratio of the amount of the mortgage to the property's value is called the loan-to-value ratio (LTV)

- The lower the LTV, the higher the borrower's equity
- From the lender's perspective, the higher the borrower's equity, the less likely the borrower is to default.
- the lower the LTV, the more protection the lender has if the borrower does default and the lender repossesses and sells the property.
- When the loan is first taken out, the borrower's equity in the property is equal to the down payment. Over time, the LTV changes: As the borrower makes mortgage payments, including principal repayments, the outstanding balance on the loan is reduced and as the market value of the property changes, the borrower's equity also changes. LTV serves as a key measure both in residential and commercial mortgages.

View Markdown Source

```
### Loan-to-Value Ratio (LTV)

$$
\text{LTV} = \frac{\text{Loan Amount}}{\text{House Price}}
$$

- The ratio of the amount of the mortgage to the property's value is called
  the loan-to-value ratio (LTV)
- The lower the LTV, the higher the borrower's equity
- From the lender's perspective, the higher the borrower's equity, the less
  likely the borrower is to default.
- the lower the LTV, the more protection the lender has if the borrower does
  default and the lender repossesses and sells the property.
- When the loan is first taken out, the borrower's equity in the property is
  equal to the down payment. Over time, the LTV changes: As the borrower
  makes mortgage payments, including principal repayments, the outstanding
  balance on the loan is reduced and as the market value of the property
  changes, the borrower's equity also changes. LTV serves as a key measure
  both in residential and commercial mortgages.
```

Debt-to-Income Ratio (DTI)

$$\text{TI} = \frac{\text{Monthly Debt Payment}}{\text{Monthly Pre - Tax Gross Income}}$$

- The capacity to sustain debt payments is another consideration. For residential lending, the metric is the debt-to-income ratio (DTI), which compares an individual's monthly debt payments to their monthly pre-tax, gross income

- Lenders, including mortgage lenders, use the DTI to measure an individual's ability to manage monthly payments and repay debts.

- A low DTI shows a balance between income and debt and suggests that the borrower could sustain additional debt.

- A high DTI ratio signals that the borrower may carry too much debt for the amount of income earned each month.

- Typically, lenders want to see low DTI ratios before extending loans to a potential borrower.

View Markdown Source

```
### Debt-to-Income Ratio (DTI)

$$
\text{TI} =
\frac{\text{Monthly Debt Payment}}{\text{Monthly Pre - Tax Gross Income}}
$$

- The capacity to sustain debt payments is another consideration. For
  residential lending, the metric is the debt-to-income ratio (DTI), which
  compares an individual's monthly debt payments to their monthly pre-tax,
  gross income
- Lenders, including mortgage lenders, use the DTI to measure an individual's
  ability to manage monthly payments and repay debts.
- A low DTI shows a balance between income and debt and suggests that the
  borrower could sustain additional debt.
- A high DTI ratio signals that the borrower may carry too much debt for the
  amount of income earned each month.
- Typically, lenders want to see low DTI ratios before extending loans to a
  potential borrower.
```

Weighted Average Coupon Rate (WAC)

$$WAC = i_A \left(\frac{CB_A}{\sum_{CB}}\right) + i_B \left(\frac{CB_B}{\sum_{CB}}\right) + i_C \left(\frac{CB_C}{\sum_{CB}}\right) + i_D \left(\frac{CB_D}{\sum_{CB}}\right) + i_E \left(\frac{CB_E}{\sum_{CB}}\right)$$

Where:

- i: Interest Rate
- BB: Beginning Balance
- CB: Current Balance
- MM: Number of Months to Maturity
- The WAC is calculated by weighting the mortgage rate of each mortgage in the pool by the percentage of the outstanding mortgage balance relative to the outstanding amount of all the mortgages in the pool.

View Markdown Source

```
### Weighted Average Coupon Rate (WAC)

$$
WAC = i_A\left(\frac{CB_A}{\sum_{CB}}\right) +
i_B\left(\frac{CB_B}{\sum_{CB}}\right) +
i_C\left(\frac{CB_C}{\sum_{CB}}\right) +
i_D\left(\frac{CB_D}{\sum_{CB}}\right) +
i_E\left(\frac{CB_E}{\sum_{CB}}\right)
$$

Where:

- $i$: Interest Rate
- $BB$: Beginning Balance
- $CB$: Current Balance
- $MM$: Number of Months to Maturity
- The WAC is calculated by weighting the mortgage rate of each mortgage in
  the pool by the percentage of the outstanding mortgage balance relative to
  the outstanding amount of all the mortgages in the pool.
```

Weighted Average Maturity (WAM)

$$WAM = MM_A \left(\frac{CB_A}{\sum_{CB}}\right) + MM_B \left(\frac{CB_B}{\sum_{CB}}\right) + MM_C \left(\frac{CB_C}{\sum_{CB}}\right)$$

Where:

- i: Interest Rate
- BB: Beginning Balance
- CB: Current Balance
- MM: Number of Months to Maturity
- the WAM is calculated by weighting the remaining number of months to maturity of each mortgage in the pool by the outstanding mortgage balance relative to the outstanding amount of all the mortgages in the pool.

View Markdown Source

```
### Weighted Average Maturity (WAM)

$$
WAM = MM_A \left(\frac{CB_A}{\sum_{CB}}\right) +
MM_B \left(\frac{CB_B}{\sum_{CB}}\right) +
MM_C \left(\frac{CB_C}{\sum_{CB}}\right)
$$

Where:

- $i$: Interest Rate
- $BB$: Beginning Balance
- $CB$: Current Balance
- $MM$: Number of Months to Maturity
- the WAM is calculated by weighting the remaining number of months to
  maturity of each mortgage in the pool by the outstanding mortgage balance
  relative to the outstanding amount of all the mortgages in the pool.
```

Debt Service Coverage Ratio (DSCR)

DSCR or DSC Ratio

$$\text{DSC} = \frac{\text{Net Operating Income}}{\text{Debt Service}}$$

View Markdown Source

```
### Debt Service Coverage Ratio (DSCR)

DSCR or DSC Ratio

$$
\text{DSC} = \frac{\text{Net Operating Income}}{\text{Debt Service}}
$$
```

Net Operating Income (NOI)

$$\text{NOI} = (\text{Rental Income } - \text{ Cash Operating Expense}) - \text{Replacement reserves}$$

- NOI is defined as the rental income reduced by cash operating expenses and a non-cash replacement reserve reflecting the depreciation of the property over time.
- NOI excludes principal and interest payments on loans, capital expenditures, depreciation, and amortization.

View Markdown Source

```
### Net Operating Income (NOI)

$$
\text{NOI} = (\text{Rental Income } - \text{ Cash Operating Expense}) -
\text{Replacement reserves}
$$

- NOI is defined as the rental income reduced by cash operating expenses and
  a non-cash replacement reserve reflecting the depreciation of the property
  over time.
- NOI excludes principal and interest payments on loans, capital expenditures,
  depreciation, and amortization.
```