

CMBS Products

Morningstar Credit Ratings, LLC is a nationally recognized statistical rating organization, or NRSRO, that has earned a reputation for innovation and excellence. Morningstar's goal is to help institutional investors identify and understand credit risk. Our analytical approach stresses transparency of the ratings process, strong fundamental credit analysis, and comprehensive investor-focused reporting that provides a concise Morningstar perspective on credit risk.

Our Mission

Morningstar's mission is to create great products that help investors. We accomplish this by providing unbiased and trustworthy credit ratings and credit risk analysis.

How We Help Investors

Morningstar's credit analysis helps investors make better-informed investment decisions. Our analysis is based on a thorough understanding of critical risk factors which allows our analysts to develop clear and concise opinions that focus investors on the credit risks that truly matter.

What We Provide Investors

Our knowledgeable analytical staff, investor relations team, and business development staff provides investors and issuers with comprehensive credit analysis, unprecedented responsiveness, and the highest level of customer service. We also provide investors with access to research and analytical services, data, and technology solutions.

CMBS Credit Risk Monitoring and Analytics

Morningstar strives to provide the marketplace with independent, transparent, through-the-credit-cycle analysis of commercial mortgage-backed securities, or CMBS. To achieve this objective, Morningstar employs the combination of an extensive proprietary database that tracks, collects, and aggregates CMBS loan performance data for our dedicated team of real estate analysts to analyze. This team uses an extensive and proprietary analytical and a quantitative CMBS subordination model and has access to a wide array of third-party commercial real estate market data to complete the process of real estate credit evaluation.

Morningstar's monitoring services are designed for portfolio managers, analysts, and traders in CMBS or the commercial real estate marketplace. Our services include a web-based monitoring tool that provides access to Morningstar's proprietary credit analysis on

thousands of CMBS loans, properties, and securities, along with state-of-the-art features for tracking portfolio, bond, and collateral level performance.

CMBS Monitoring Process Methodology

Morningstar's monthly monitoring process ensures timely reporting on new credit events affecting CMBS transactions, which results in analysis that is up-to-date, accurate, and stable. Each month, Morningstar conducts a thorough quantitative and qualitative analysis on the underlying loans and properties that collateralize a CMBS transaction to produce an estimated property value and loss estimate for each loan. The results of the collateral analysis are then applied to the class structure of the transaction to determine the impact of the loss projections on each class of the CMBS transaction. Updated collateral statistics are analyzed on a monthly basis by Morningstar's CMBS analysts to ensure that estimates of collateral value and corresponding loss forecasts reflect changes in loan workout status, collateral performance, and market conditions. The loan and property-level analysis include a review of current or future operating cash flow stability, tenant base, property condition, and market performance. The result of this monthly review is the Morningstar DealView[®] CMBS Monitoring report, which provides a comprehensive credit analysis for each CMBS transaction covered by Morningstar.

Morningstar's monitoring services provide the following features:

- ▶ Monthly monitoring on a Vast Majority of the CMBS Universe
- ▶ Likely and Bearish Case Valuations with Forecasted Losses
- ▶ Deal Losses and Credit Event Indicators
- ▶ Perspective on Critical Risk Factors
- ▶ Exportable Data Options (Data Export, Excel Add-In, API)
- ▶ Customized Reporting Capabilities

Morningstar Loan Analysis

Morningstar employs a multistep approach for estimating losses first at the loan and property level that translate into aggregate losses applied at the transaction level for individual tranche analysis. One of the primary drivers behind expected loss estimates provided is a quantitative method of identifying potentially troubled loans, referred to as high-risk loans. HRLs are determined by the performance of the following six key loan metrics:

- ▶ Debt Service Coverage Ratio
- ▶ Loan-to-Value Ratio
- ▶ Occupancy
- ▶ Term to Maturity
- ▶ Metropolitan Statistical Area
- ▶ Tenant Rollover

Analysts estimate collateral value and expected losses on individual loans of concern that begin with all currently distressed loans and loans that may indicate future distress, such as loans that are delinquent, foreclosed, real estate owned, or specially serviced, as well as loans issued to borrowers in bankruptcy.

Morningstar also flags loans backed by properties for which updated financial reporting or collateral related statistics indicates potential problems or default risk. For example, this may include any cash flow decreases since issuance, drops in occupancy, material deferred maintenance, a pending loss of a significant tenant, or bankruptcy of a major tenant.

Morningstar supplements the analysis of this initial group of loans with loans that exhibited a material adverse change over the previous month regardless of their current performance status. Morningstar's material adverse change analysis also serves as part of its quality-control process to identify servicer or trustee data errors.

On an ad hoc basis, analysts consider Morningstar Alerts that focus on relevant news announcements or unforeseen events that might affect the default risk and projected value of properties or loans. Inherently impossible to predict, they cannot be incorporated

into a purely statistical model, yet they can dramatically affect value. Morningstar believes that the ability of its analysts to include forward-looking information is a major advantage of its approach over purely statistical models.

All loans identified by Morningstar's process are individually analyzed by a Morningstar analyst on a monthly basis while data is updated within the Morningstar CMBS database. It is assumed that all current distressed loans will be liquidated, while loans flagged with a potential for default are treated as having a probability of progressing to liquidation, with the probability based on the loan's characteristics and the actual rates of default Morningstar observed over the years for loans with these characteristics.

Probability of Default

Using Morningstar's historical CMBS collateral database, which dates back to 2002, Morningstar has created a statistical model that uses regression and correlation analysis to assign an HRL score and probability of default and a risk score to all the loans in the CMBS database.

Morningstar uses a curvilinear probability model to calculate a point estimate for the probability of default for a given loan. Loans are categorized by property type: office, multifamily, industrial, hotel, retail, health care, or other. This categorization is done to account for the variation of loan characteristics across property types. Each loan is then labeled as in default or not. For this purpose, Morningstar defines a loan as in default if that particular loan is 60 days or more past due, or if the loan has been transferred to a special servicer. The debt service coverage ratio for each loan is then placed into a bucket with a defined range. Each bucket contains at least 20 loans and is specific to each property type.

The regression analysis results in a set of coefficients for each DSCR bucket by property type. These coefficients may then be used to construct probability of default curves for each property type.

Multiple Valuations

Morningstar's multiple valuation process for estimating potential losses on loans incorporates various methods across assets that focus on individual types of distress, collateral location, actual or projected cash flow, and other tangible sales or appraisal comparisons. This includes, but is not limited to, the following methods:

- ▶ Discounted Cash Flow
- ▶ Dark Value
- ▶ Sales Comparisons
- ▶ Income Approach
- ▶ Actual Sales
- ▶ Bifurcated Modification
- ▶ Bankers Opinion of Value

Morningstar derives cap rates from multiple sources and most importantly, leverages its own proprietary database of cap rates. These are collected from all CMBS transactions monitored as part of its regular, including newly issued transactions rated by Morningstar.

Once the analyst has a final estimate of the underlying property value, this value is compared with the total loan exposure, fully burdened for advances, and other costs of foreclosure, to arrive at an estimate of the likely loss from liquidation. The final output from this analysis is an estimate of the expected loss to the trust and an estimate of the time until liquidation.

Custom CMBS Analytic Solutions

Morningstar's custom analytic solutions provide investors across the credit spectrum with in-depth, cutting-edge surveillance tools tailored to meet their specific needs.

Our custom analytic solutions go beyond the base level web-based monitoring tool to provide non-investment-grade CMBS investors with an effective monitoring platform tailored to their specific needs. The service includes access to a customized loan and property level database with custom, unique client preferred data points, re-underwriting capabilities,

custom surveillance reporting, customized watchlist functionality, and full access to Morningstar's CMBS collateral database and comprehensive DealView® CMBS Monitoring of hundreds of CMBS transactions.

CMBS Data Services

Morningstar's CMBS Data Services provides investors with access to CMBS collateral data and Morningstar's proprietary valuations, probability of default, and expected loss data. This data is available via a number of delivery options to allow for integration with third-party systems and proprietary models.

CMBS Data Sets

Morningstar Data

Morningstar's proprietary data set includes Morningstar ratings and analyst-derived valuations, probability of default, and expected loss data at a deal, loan, and property level.

Morningstar Loan

More than 40 data points are available at the Morningstar loan level. This data set includes, but is not limited to the following:

- ▶ Forecasted Loss/Valuation
- ▶ HRL Score and Percentage
- ▶ Multiple Valuations
- ▶ Loss Vectors
- ▶ Morningstar Top 10 Comment
- ▶ Morningstar Watchlist Comment
- ▶ Probability of and Loss Given Default (Severity)

Morningstar CMBS Ratings

This data set includes Morningstar's proprietary analysis data for the majority of CMBS transactions dating back to 2008, such as:

- ▶ Current Rating
- ▶ Morningstar Forecast Credit Support
- ▶ Original Rating
- ▶ Rating Affirmation or Change Date

CMBS Collateral Data

This data set includes CMBS loan data received from servicers and third-party data providers and is available at the loan, property, and tranche levels. More than 200 data points are available in the CMBS collateral data set.

Loan

This data is available at three levels including loan level, additional debt, and reserves. Data points include loan terms, financials, performance summary, and call protection information such as:

- ▶ Current Unpaid Balance
- ▶ Maturity Date
- ▶ Call Protection
- ▶ Reserves
- ▶ Loan Status
- ▶ Additional Debt
- ▶ Loan Workout
- ▶ Debt Yield

Property

This level of data includes descriptive property-level information, such as:

- ▶ Location
- ▶ Appraisal
- ▶ Lease Rollover/Tenant Information
- ▶ Property (Type/Size)

Tranche

This data includes bond-level information, such as:

- ▶ CUSIP
- ▶ Interest Shortfall
- ▶ Credit Support
- ▶ Coupon
- ▶ Principal Payment

CMBS Documents

Morningstar data feed clients have delivery options to receive various types of Morningstar deal analysis documents, as well as third-party industry reports, including, but not limited to, the following:

- ▶ Morningstar New Issue: Presale, Loan Analysis Summary Table, Postsale/Final Ratings Confirmation
- ▶ Morningstar DealView Analysis
- ▶ Remittance Report
- ▶ Prospectus
- ▶ PSA
- ▶ Annex A

Available Delivery Methods

Many of Morningstar's clients maintain their own quantitative CMBS models and are looking for delivery options for integration with their internal systems and models. Morningstar offers several options for its CMBS analytical data:

Data Export

Morningstar provides the ability to export data directly into Microsoft® Excel® from Morningstar's CMBS Ratings Surveillance platform.

Application Programming Interface (API)

Morningstar provides a standard, secure means of communicating information between third-party software applications and Morningstar's CMBS database.

Microsoft® Excel® Add-In

This feature provides seamless integration between Morningstar's CMBS surveillance database and a client's Excel files, adding functionality, which allows clients to work more efficiently.

Reviewed and Updated Daily

Analysts review Morningstar's data to complete the Morningstar DealView CMBS Monitoring analyses. Morningstar's database is updated daily to capture both data changes triggered by Morningstar analysts and timely financial reporting, including information in the CRE Finance Council Investor Reporting Package.

CMBS Lead Generator

CMBS Lead Generator is a web-based lead sourcing tool that provides commercial real estate professionals with access to a robust source of CMBS refinance leads, property/transfer sales, tenancy, and workout opportunities by combining Morningstar CMBS loan and property data with proprietary collateral analysis, detailed financial data, and estimates of property value and refinance proceeds.

Identify Loans by:

- ▶ Loan Terms/Maturity
- ▶ Property Type/Size
- ▶ Call Protection Status/Defeasance
- ▶ Property Address/Geographic Area
- ▶ Delinquency Status/Performance Indicators

Identify Leasing Opportunities by:

- ▶ Tenant Name
- ▶ Lease Expiration Date
- ▶ Occupancy
- ▶ Location
- ▶ Lease Rollover

CMBS Lead Generator Features

CMBS Lead Generator provides a summary report for each loan matching a client's search criteria including the following detailed information:

- ▶ Property Level
- ▶ Collateral Summary
- ▶ Performance Summary
- ▶ Loan Summary
- ▶ Financial Statements
- ▶ Call Protection
- ▶ Delinquency
- ▶ Borrower Data
- ▶ Morningstar Comments
- ▶ Servicer Comments

Other key features include the following:

- ▶ Multiple Sources of Data Create a Powerful Data Set
- ▶ Comprehensive Loan Filter Tool
- ▶ Estimates of Prepayment Premiums, Defeasance Costs, and Property Values
- ▶ Market Cap Rates and Revenue/Expense Comparables

CMBS MarketView Explorer

CMBS MarketView Explorer provides commercial real estate investors, lenders, brokers, and developers with a powerful interactive database search tool with nationwide coverage for all major property types, such as office, multifamily, retail, industrial, lodging, self-storage, and health care. Users have access to detailed operating, revenue, and expense data, including:

- ▶ Base Rent
- ▶ Expense Reimbursement
- ▶ Real Estate Taxes
- ▶ Repairs and Maintenance
- ▶ Professional and General Administrative Fees
- ▶ Ground Rent
- ▶ Tenant Improvements
- ▶ Capital Expenditures

Interactive Search Tools

Users have the ability to create detailed searches of the CMBS MarketView Explorer database using the interactive search tool to search by:

- ▶ Property Address
- ▶ Property Type
- ▶ MSA/Submarket
- ▶ City, State, or Zip Code
- ▶ Property Size
- ▶ Financial Performance

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