

# Construction Rules for the Morningstar® Target Risk Index Family

## Morningstar Indexes

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## Overview

The Morningstar Target Risk Index Family is a broadly diversified index that helps investors mitigate the challenges related to rising life expectancies, evolving risk appetites, inflation in major retirement expense categories, and postretirement income investing. The index family is designed to meet the needs of investors who would like to maintain a target level of equity exposure. Conceptually, the Morningstar Target Risk Index family are indexes of indexes.

The key objectives of the Morningstar Target Risk Index is:

- ▶ **Transparency:** Morningstar indexes are rules-based to provide a level of continuous transparency that committee-based indexes are not able to offer.
- ▶ **Comprehensive:** global asset coverage for an optimal efficient frontier.
- ▶ **Investable:** Morningstar index security selections pass liquidity and pricing screens to ensure index accuracy and promote index replication.
- ▶ **Seamless asset-class representation:** Index building blocks from one source enhance attribution analysis by eliminating asset-class overlap.

There are two main considerations in the construction rules for the index:

### Asset Allocation

The asset allocation provides the optimal portfolio of stocks, bonds, and cash. It is driven by Ibbotson Associates' — a division of Morningstar Investment Management — asset allocation methodology.

### Security Selection Methodology

The security selection is defined by the rules-based methodology applicable to each underlying Morningstar index in the constituents list.

The index family provides global equity market risk levels that are scaled to fit five equity market risk profiles: aggressive, moderately aggressive, moderate, moderately conservative, and conservative. The five levels of global equity exposure are set at 95%, 80%, 60%, 40%, and 20%.

**Exhibit 2 Global Asset-Class Coverage**



**Index Inception Date and Performance Inception Date**

The inception date of the index family is February 18, 2009, and the performance inception date of the index family is December 31, 1998, when the first back-tested index value was calculated.

## Index Construction

### Assigning Indexes to the Index

#### Index Universe

Morningstar index constituents of Target Risk Index family are listed below. The index constituents are reviewed annually. Rules governing security inclusion into the constituent index, index reconstitution/rebalancing, security splits/dividends/contract expirations, and other index mechanics are detailed in the rulebooks that govern each index. These rulebooks are available on the [Morningstar website](#).

#### Constituent Indexes:

- ▶ Morningstar® US Large Cap Growth Index<sup>SM</sup>
- ▶ Morningstar® US Large Cap Value Index<sup>SM</sup>
- ▶ Morningstar® US Large Cap Core Index<sup>SM</sup>
- ▶ Morningstar® US Mid Cap Growth Index<sup>SM</sup>
- ▶ Morningstar® US Mid Cap Value Index<sup>SM</sup>
- ▶ Morningstar® US Mid Cap Core Index<sup>SM</sup>
- ▶ Morningstar® US Small Cap Growth Index<sup>SM</sup>
- ▶ Morningstar® US Small Cap Value Index<sup>SM</sup>
- ▶ Morningstar® US Small Cap Core Index<sup>SM</sup>
- ▶ Morningstar® US REIT Index<sup>SM</sup>
- ▶ Morningstar® Developed Markets ex-US Index<sup>SM</sup>
- ▶ Morningstar® Emerging Markets Index<sup>SM</sup>
- ▶ Morningstar® Long-Term Core Bond Index<sup>SM</sup>
- ▶ Morningstar® Intermediate-Term Core Bond Index<sup>SM</sup>
- ▶ Morningstar® Short-Term Core Bond Index<sup>SM</sup>
- ▶ Morningstar® Global ex-US Government Bond Index<sup>SM</sup>
- ▶ Morningstar® Emerging Markets Composite Bond Index<sup>SM</sup>
- ▶ Morningstar® Global Government Bond Index<sup>SM</sup>
- ▶ Morningstar® TIPS Index<sup>SM</sup>
- ▶ Morningstar® Long-Only Commodity Index<sup>SM</sup>
- ▶ Morningstar® Cash Index<sup>SM</sup>

#### Number of Constituents

The index contains 21 Morningstar indexes that meet the stated objectives of the index.

#### Index Weighting

To create the asset allocation for the benchmarks, Ibbotson employs mean-variance analysis and re-sampled mean-variance analysis to evaluate and to help determine appropriate asset allocation. Mean-variance optimization refers to a mathematical process that calculates the asset-class weights that provide an asset allocation combination with the maximum expected return for a given level of risk or,

conversely, the minimum risk for a given expected return. The inputs that drive the optimization are the capital market assumptions.

For more details, refer to Section 2 of the Ibbotson report [Lifetime Asset Allocations: Methodologies for Target Maturity Funds](#).

To ensure predictability in the index weights, the maximum year-over-year change in the indexes' asset allocations is set at 2 percentage points per asset class, with one exception: when an asset class is either added or deleted from an index. In the unusual case of an addition or deletion of an asset class, the weights of the asset classes will be rescaled proportionately, and the 2-percentage-point per asset class maximum change will be applied to the rescaled weights.

### **Index Maintenance and Calculation**

#### **Scheduled Maintenance**

The index is reconstituted annually and implemented after the close of business on the third Friday of June and is effective the following Monday. If Monday is a holiday, reconstitution is effective on the immediate following business day.

The index is rebalanced quarterly and implemented after the close of business on the third Friday of March, June, September, and December and is effective the following Monday. If Monday is a holiday, rebalance is effective on the immediate following business day.

Refer to Appendix 1 for details on reconstitution and rebalancing.

#### **Price Data**

Price data is the end-of-day total-return index level of index constituents calculated by Morningstar for index-level calculation.

### **Methodology Review and Index Cessation Policy**

The index methodology is continually reviewed to ensure it achieves all stated objectives. These reviews take into account corporate action treatment, selection, and maintenance procedures. Subscribers to the index will be notified before any methodology changes are made. For more details, refer to the [Morningstar Index Methodology Change Process](#).

Morningstar also notifies all subscribers and stakeholders of the index that circumstances might arise that require a material change to the index, or a possible cessation of the index. Circumstances that could lead to an index cessation include, but are not limited to, market structure change, product definition change, inadequate supply of data, insufficient revenue associated with the index, insufficient number of clients using the index, and/or other external factors beyond the control of the Morningstar Index Committee.

Because the cessation of the index or benchmark index could disrupt subscriber products that reference this index, all subscribers are encouraged to have robust fallback procedures if an index is terminated. For more details, refer to the [Morningstar Index Cessation Process](#).

### **Data Correction and Precision**

#### **Intraday Index Data Corrections**

Commercially reasonable efforts are made to ensure the accuracy of data used in real-time index calculations. If incorrect price or corporate action data affect index daily highs or lows, they are corrected retroactively as soon as is feasible.

#### **Index-Related Data and Divisor Corrections**

Incorrect pricing and corporate action data for individual issues in the database will be corrected upon detection. In addition, an incorrect divisor of an index, if discovered within five days of its occurrence, will always be fixed retroactively on the day it is discovered to prevent an error from being carried forward. Commercially reasonable efforts are made to correct an older error subject to its significance and feasibility.

For more details, refer to the [Recalculation Guidelines](#).

#### **Computational and Reporting Precision**

For reporting purposes, index values are rounded to two decimal places and divisors are rounded to appropriate decimal places.

## Appendixes

### Appendix 1: Glossary

Terms	Description
<b>Reconstitution</b>	During each reconstitution, the membership is reset and the index weight of each constituent is adjusted.
<b>Rebalance</b>	During each rebalance, the weights are reset.

### Appendix 2: Target-Risk Methodology

For over 30 years Ibbotson Associates has been a leading developer of target-risk asset allocation models. Ibbotson Associates opened in 1977 to bridge the gap between modern financial theory and real-world investment practice. Professor Roger G. Ibbotson, the company's founder, pioneered the collection of the requisite historical data used in asset allocation and quantified the benefits of diversification.

Many of the methodologies used to create the target-risk asset allocation models are discussed in greater detail in the Stocks, Bonds, Bills and Inflation yearbook.

Based on the available asset classes in the Morningstar index family, Ibbotson has defined five asset allocations ranging from conservative to aggressive. These asset allocations support a family of target-risk indexes that adequately cover the risk and return spectrum.

To create the asset allocation for the benchmarks, Ibbotson employs mean-variance analysis and re-sampled mean-variance analysis to evaluate and to help determine appropriate asset allocation. Mean-variance optimization refers to a mathematical process that calculates the asset-class weights that provide an asset allocation combination with the maximum expected return for a given level of risk or, conversely, the minimum risk for a given expected return.

The inputs that drive the optimization are the capital market assumptions. Ibbotson's industry-leading methodology for forecasting asset-class optimization inputs grew out of the pioneering work of Roger Ibbotson and Rex Sinquefeld in the 1970s. During the last 30 years, Ibbotson has continued to refine this process while maintaining a stable and consistent methodology.

Ibbotson uses a "building block" approach, combining historical relationships with current market expectations to generate expected returns. This approach separates the expected return of each asset class into three key components: a real risk-free rate, an estimate of future inflation, and a specific premium that make the return of the asset class commensurate with its risk level. A different premium is calculated for each asset class in the expected return development process.

Ibbotson chooses robust asset allocation models that are very close to the frontier under many different economic and investment performance scenarios rather than taking asset allocation combinations directly from any one mean-variance efficient frontier. This sensitivity analysis ensures that the characteristics of the asset allocation models will be relatively stable over time. Because it is highly likely that there will be some uncertainty in forecasts, stable asset allocations minimize the need for frequent changes to the asset allocation models.

Ibbotson believes strongly in the benefits of diversification. All else equal, a larger opportunity set of investable asset classes should result in an efficient frontier with improved risk and return characteristics. The Morningstar family of individual asset-class indexes allows Ibbotson to construct asset allocation models that should produce long-term risk and return characteristics that represent best-in-class benchmarks.

Morningstar's Asset Allocation Index committee oversees the creation of the target-risk benchmarks. The target-risk asset allocations are updated annually in June. At least one month before the update (the Scheduled Reconstitution Date), any changes to the benchmark weights will be announced.

### Appendix 3: Modification to Rulebook

Section	Description	Update Date
<b>Index Construction</b>	Included Morningstar US REIT Index as a constituent in the Morningstar Asset Allocation Index.	June 2016

**About Morningstar, Inc.**

Morningstar, Inc. is a leading provider of independent investment research in North America, Europe, Australia, and Asia. Morningstar offers an extensive line of products and services for individual investors, financial advisors, asset managers, and retirement plan providers and sponsors. Morningstar provides data on approximately 510,000 investment offerings, including stocks, mutual funds, and similar vehicles, along with real-time global market data on more than 17 million equities, indexes, futures, options, commodities, and precious metals, in addition to foreign exchange and Treasury markets. Morningstar also offers investment management services through its investment advisory subsidiaries.

**About Morningstar Indexes**

Morningstar® Indexes combine the science and art of indexing to give investors a clearer view into the world's financial markets. Our indexes are based on transparent, rules-based methodologies that are thoroughly back-tested and supported by original research. Covering all major asset classes, our indexes originate from the Morningstar Investment Research Ecosystem—our network of accomplished analysts and researchers working to interpret and improve the investment landscape. Clients such as exchange-traded fund providers and other asset management firms work with our team of experts to create distinct, investor-focused products based on our indexes. Morningstar Indexes also serve as a precise benchmarking resource.

**Morningstar Index Committee**

The [Morningstar Index Committee](#) is currently comprised of senior officials who possess the appropriate levels of knowledge in relation to Indexes. A wide array of business groups are represented to allow for a broad voice to be heard and for a wider view to be expressed in evaluating all subjects brought up during Committee meetings. The Committee seeks to create indexes of the highest quality that meet the recognized qualities of a good benchmark.

**For More Information**

For any queries, reach out to us via our [communication page](#).



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