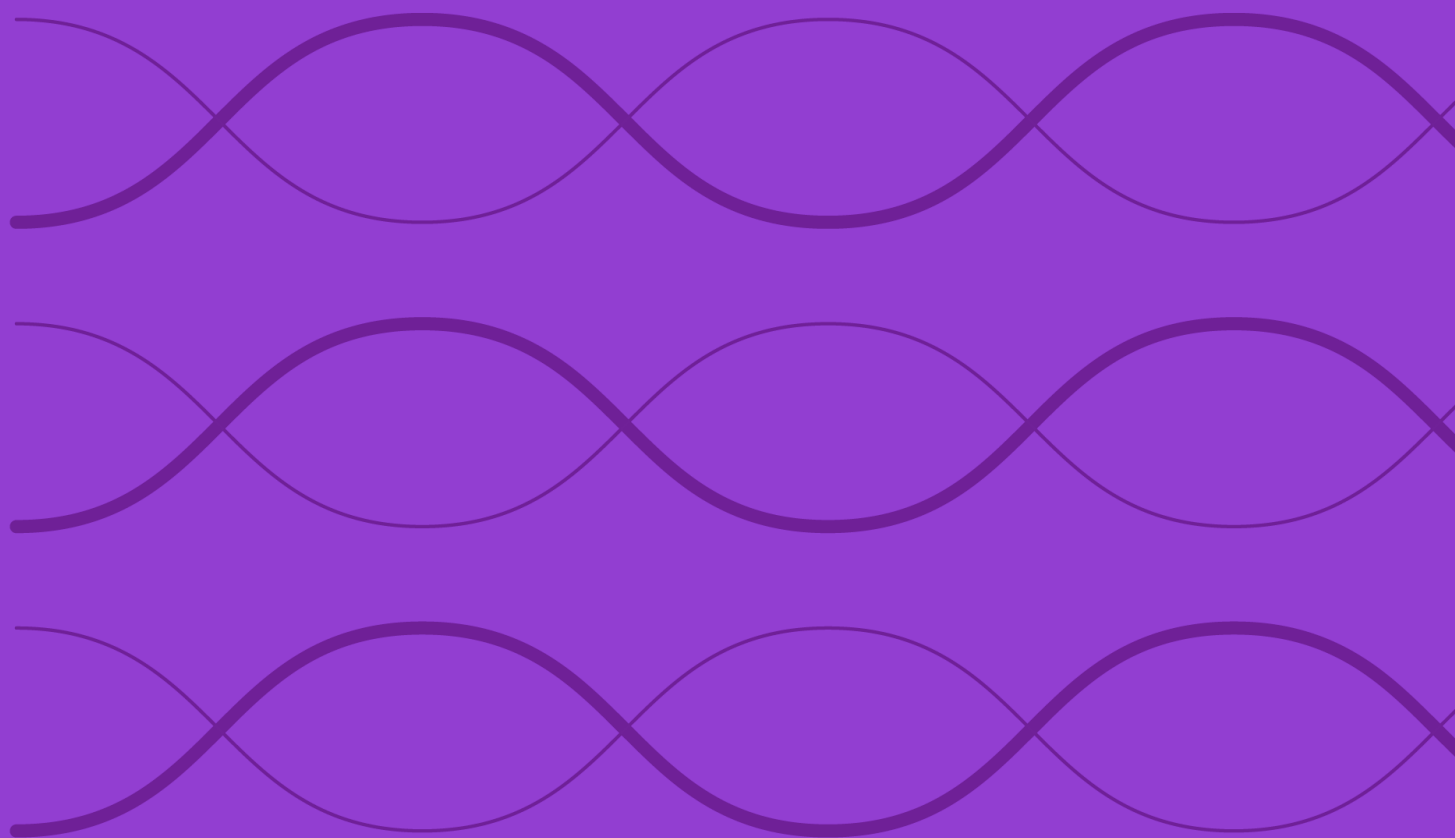


# Construction Rules for the Morningstar PitchBook US Buyout Replication Index



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## Overview

The Morningstar PitchBook US Buyout Replication Index is designed to capture the key characteristics of buyout investing by tracking publicly traded small- and mid-cap stocks that resemble companies in private equity buyout funds. It employs a systematic approach, combining top-down industry exposure aligned with the U.S. buyout market and bottom-up company selection using dynamic public market data to identify mature businesses with established cash flows.

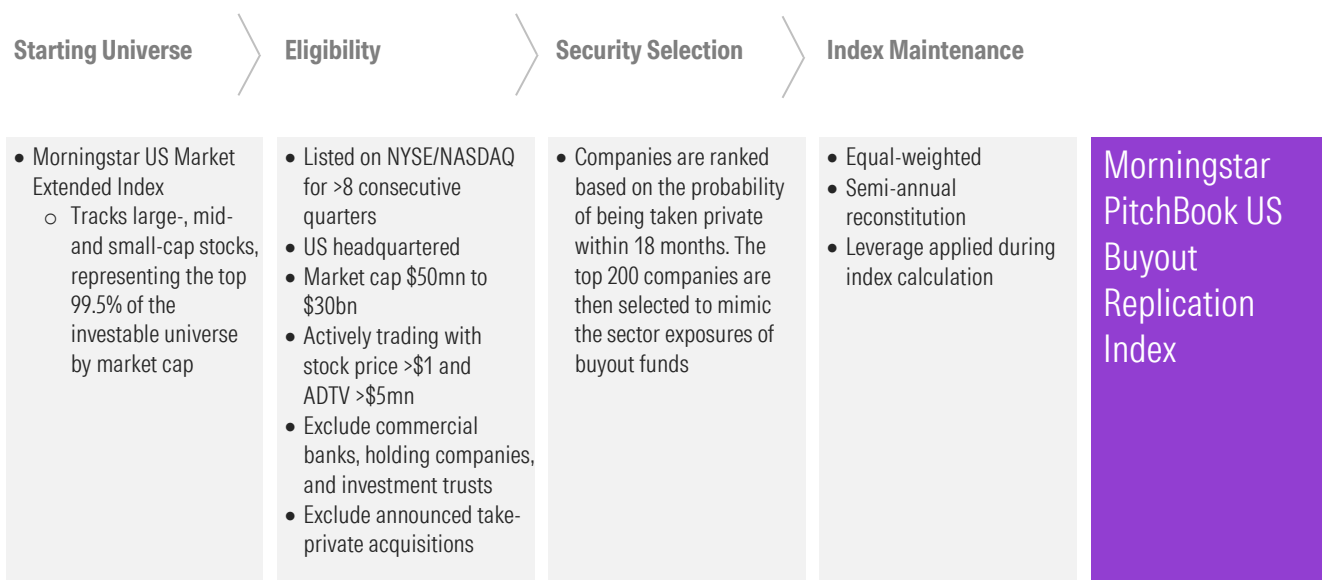
This index does not incorporate environmental, social, or governance criteria.

## Index Inception and Performance Start Date

The index inception date is November 25, 2024, and the performance start date, when the first back-tested index value was calculated, is December 20, 2013.

## Index Construction

### Methodology Summary



### Starting Universe

At each reconstitution, constituents of the Morningstar PitchBook US Buyout Replication Index are derived from the Morningstar US Market Extended Index, which tracks large-, mid- and small-cap stocks, representing the top 99.5% of the investable universe by market capitalization. For more details on benchmark construction, refer to the construction rules for the [Morningstar US Market Extended Index](#).

### Eligibility

To be eligible for index inclusion, all constituents must meet the following criteria:

- Primary share-class of a company listed on NYSE/NASDAQ for at least 8 consecutive quarters
- Headquartered in the US
- Total market-cap to be between \$50 million and \$30 billion
- Actively trading with stock price > \$1
- Have an average daily traded value >\$5 million
- Not be registered as a commercial bank, holding company, or investment trust
- Not have an announced take-private acquisition<sup>1</sup>

<sup>1</sup> Take-private data is sourced from PitchBook and is defined in [Appendix 1](#).

## Security Selection

The proprietary long short-term memory (LSTM) neural network<sup>2</sup> predicts the probabilities of companies being taken private. The companies ranked highest for predicted probability of being taken private are selected, while keeping sector-exposures in line with those of PitchBook's inventory of buyout-backed companies.

1. Long short-term memory neural network predicts the probabilities of being taken private in the next 18 months
2. Eligible companies are ranked in descending order of predicted probabilities
3. Top-ranked companies within each sector are selected to make up 200 stocks, and keep sector-exposures in line with those of PitchBook's inventory of buyout-backed companies

### *Number of Stocks*

The index targets 200 stocks based on a transparent ranking system subject to the application of eligibility criteria at reconstitution. The actual number of stocks in the index may be fewer than 200 due to rounding down during the calculations, or due to corporate actions. If fewer than the targeted number of securities from the starting universe meet eligibility criteria, or if securities are added or deleted as a result of corporate actions after reconstitution, the constituent count may deviate from the targeted number. During reconstitution, if the number of eligible securities is less than the targeted constituent count, all eligible securities are selected. The reconstitution schedule is provided in the "Index Maintenance and Calculation" section.

### *Index Weighting*

The index is equal weighted. For more details, refer to the [Morningstar Indexes Calculation Methodology rulebook](#).

## Index Maintenance and Calculation

### Reconstitution and Rebalancing

The index is reconstituted, where the membership is reset, and rebalanced semi-annually on the third Friday of June and December. Adjustments are implemented after Friday's market close and reflected the following Monday. If Monday is an index holiday, reconstitution is reflected the next business day. The market data used for reconstitution is as of the last trading day of May and November.

Index files are published according to the global calendar schedule. For more information, please refer to the [Morningstar Indexes Holiday Calendar](#).

### Corporate Actions

The treatment of corporate actions will be as per the alternatively weighted indexes corporate action methodology. For more details, please refer to the [Morningstar Indexes Corporate Actions Methodology](#).

### Index Calculation and Price Data

Both levered and unlevered variants of the index are available.

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<sup>2</sup> Details of the LSTM neural network can be found in [Appendix 2](#).

### *Unlevered Index Variant Calculation*

The unlevered return variant is calculated by applying daily price-changes and corporate-actions to the index portfolio.

### *Levered Index Variant Calculation*

The target leverage ratio of 1.5x is applied to arrive at the levered index and is reset along with index reconstitution. The leverage factor drifts daily until the next reconstitution, because daily equity returns apply only to the equity component of the index. The levered return variant is calculated by applying the daily drifted leverage factor to the unlevered index return and adjusting it for the daily cost of leverage (interest). The interest is assumed to accumulate daily at risk-free rate (Fed Funds Rate) plus an annual spread of 200 bps and paid out monthly.

Additional details about index calculations and price data can be found in their respective rulebooks: [Morningstar Indexes Calculation Methodology](#) and [Morningstar Equity Indexes Price Methodology](#).

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

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

Morningstar Indexes notifies all subscribers and stakeholders of the index that circumstances might arise that require a material change to, or a possible cessation of, the index. These circumstances are generally not within Morningstar's control and may include significant changes to the underlying market structure, inadequate access to necessary data, geo-political events, and regulatory changes. In addition, factors such as low usage or methodology convergence may result in the cessation of an index.

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 affects index calculations, corrections are applied prospectively.

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

Incorrect pricing and corporate action data for individual issues in the database will generally be corrected upon detection. In addition, an incorrect divisor of an index, if discovered within two days of its occurrence, will 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.

## Exceptions

While Morningstar will seek to apply the method described above, the market environment, supervisory, legal, financial, or tax reasons may require an alternative approach to be adopted. A decision to take an alternative approach will be made by the relevant Morningstar Index Methodology Committee, and in all instances, the application of a nonstandard process will be reported to the Morningstar Index Oversight Committee.

## Appendixes

### Appendix 1: Glossary

**Take-private acquisition:** A take-private acquisition is a transaction structure where a publicly traded company is acquired, and its shares are de-listed from a public exchange after the transaction is complete.

### Appendix 2: Long short-term memory neural network (LSTM)

LSTM is a recurrent neural network architecture widely used in machine learning. It excels at capturing long-term dependencies, making it ideal for sequence prediction tasks. It naturally takes sequences of data as inputs, thereby making it appropriate for modelling quarterly financial statements of companies. The memory cell of an LSTM enables us to circumvent the need for manual tuning of lags, lookback windows, and other feature engineering steps which are integral parts of other machine learning models.



## About Morningstar Indexes

Morningstar Indexes was built to keep up with the evolving needs of investors—and to be a leading-edge advocate for them. Our rich heritage as a transparent, investor-focused leader in data and research uniquely equips us to support individuals, institutions, wealth managers, and advisors in navigating investment opportunities across major asset classes, styles, and strategies. From traditional benchmarks and unique IP-driven indexes to index design, calculation, and distribution services, our solutions span an investment landscape as diverse as investors themselves.

## Morningstar Index Methodology Committee

The Morningstar Index Methodology Committee oversees all new index development, index methodology changes, and cessation of indexes for any indexes where Morningstar owns the intellectual property. This committee is also charged with ensuring that indexes align with Morningstar Research principles and values. The group comprises members of the index team with index research, product development, product management, client service, index implementation, and operation expertise who provide the first layer of governance over index design and methodology.

## Morningstar Index Operations Committee

The Morningstar Index Operations Committee governs the processes, systems, and exception handling of the day-to-day management of all live indexes, including index rebalancing and reconstitution, restatements, market classification, and contingency management. The committee oversees the annual review of index methodology (as required by U.K. and EU benchmark regulations, or BMR), ensuring that methodologies remain fit for purpose and continue to achieve their stated investment objectives. The group comprises members of the index team with data, operations, corporate actions, product development, index launch, client service, and index management experience who provide the first layer of governance over index operations.

## Morningstar Index Oversight Committee

The Morningstar Index Oversight Committee is responsible for the index oversight function as per the requirements of the U.K. and European BMR, providing independent oversight of all aspects of the governance of benchmark administration as required by the relevant BMR. Its remit extends to all calculation and administration-related business activities of Morningstar Indexes, including administration of Morningstar-owned benchmarks as well as client-owned benchmarks and index calculation. The oversight function is part of the organizational structure of Morningstar but is separate and independent from the index business, index management, and the other index committees.

[www.indexes.morningstar.com](http://www.indexes.morningstar.com)

## Contact Us

[indexes@morningstar.com](mailto:indexes@morningstar.com)

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