

Choe Global Indices

Cboe® U.S. Large-Mid Cap Indices
METHODOLOGY

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1 Introduction

This document details the methodology that Cboe Global Indices ("CGI") applies to the Cboe U.S. Large-Mid Cap 100 Index (CEQX), Cboe U.S. Lead 50 Index (the "Lead 50" or "LEADX"), and Cboe U.S. Lag 50 Index (the "Lag 50" or "LAGX"), in this document each referred to as an "Index", or collectively as "Indices".

1.1 Index Objectives

The objectives of the Indices covered by this document are as follows:

- The Cboe U.S. Large-Mid Cap 100 Index (CEQX) is designed to measure total return equal-weighted index of 100 stocks selected from the Morningstar Indicative pro forma universe that is based on the Morningstar® US Large-Mid Cap Index™. Each of the 100 selected stocks is called a "Constituent Stock". During each quarterly rebalance date, the CEQX resets to a notional value of 1000.
- The **Choe U.S. Lead 50 Index (LEADX)** is designed to measure the total return of the 50 best performing stocks, based on the total reinvested return of each Constituent Stock since the previous rebalance date, of the 100 Constituents Stocks in the Choe U.S. Large-Mid Cap 100 Index.
- The Cboe U.S. Lag 50 Index (LAGX) is designed to measure the total return of the 50 worst performing stocks, based on the total reinvested return of each Constituent Stock since the previous rebalance date, of the 100 Constituents Stocks in the Cboe U.S. Large-Mid Cap 100 Index.

1.2 Supporting Documentation

This methodology should be read in conjunction with the following documents:

Choe Index Policies Practices

Global Equity Classification Structure | Morningstar Indexes

Morningstar Equity Indexes Corporate Action Methodology (only relevant to Distribution of Rights, as explained in Appendix 1)



2 Index Construction

2.1 Index Rebalance

The Indices are reviewed quarterly in March, June, September, and December using the following timetable. A Business Day is any day where the U.S. equity exchanges are open for trading.

Index Name	Index Ticker	Index Determination Date	Rebalance Date
Cboe U.S. Large-Mid Cap 100 Index	CEQX	Three (3) Business Days prior to the Rebalance Date	Third Friday of each March, June, September, December
Cboe U.S. Lead 50 Index	LEADX	Three (3) Business Days prior to the Rebalance Date	Third Friday of each March, June, September, December
Cboe U.S. Lag 50 Index	LAGX	Three (3) Business Days prior to the Rebalance Date	Third Friday of each March, June, September, December

2.2 Index Holiday Schedule

In complement to the Index Rebalance schedule, all Indices will rebalance and reset to account for scheduled and unscheduled holidays, defined further below.

- Scheduled holiday: one which is reoccurring, known in advance of the Index Determination Date (e.g. Christmas Day, Juneteenth etc.)
- Unscheduled holiday: a new holiday announced on, or after, the Index Determination Date with extremely short notice (e.g. 1, 2, or 3 days)

If a scheduled holiday falls on the Rebalance Day (RD), the 3rd Friday of a rebalance month, the rebalance dates are earlier by one Business Day (BD). If an unscheduled holiday is announced after the Determination Date, (RD -3BD), the Rebalance Day is later by one day.

2.3 Index Construction Steps

Steps 1-4 outline the construction of the Cboe U.S. Large-Mid Cap 100 Index (CEQX), while step 5 covers how the CEQX constituents are used to construct the Cboe U.S. Lead and Lag 50 Indices (LEADX and LAGX).

Step 1: Select the Source Data

Initial Universe: The Index Universe is the 500 largest market capitalization, excluding American or Global Depository receipts, companies from the indicative proforma universe of the Morningstar US Large-Mid Cap Index based on closing price and total market capitalization, as of close of determination date. The 500 largest companies, consolidated to account for multiple share classes, in any quarter will be determined after the close of trading three Business Days prior to the Index's rebalance date (the "Index Determination Date" or "R-3 BDs", where R is the rebalance date). By way of example only, if September 20th, 2024 is an Index Rebalance date, then September 17th, 2024 would be the Index determination date.



Index Constituents: The 100 stocks that will be the Cboe U.S. Large-Mid Cap 100 Index Constituent Stocks for the upcoming quarter shall be determined as of the close of trading on the Index Determination Date based on the methodology, sourced from the *Initial Universe*, outlined in Step 2 below.

Further details on the construction are defined in Appendix 1: Index Construction Specifications.

Step 2: Sector Market Capitalizations, Initial Weightings and Sector Residual Errors (R-3)

Each company within the *Index Universe* is assigned to one of the 11 industry sectors based on Morningstar's Global Equity Classification Structure (MGECS) Sector designation industry codes (listed under *Appendix 1*). Proceed with the following steps to determine the minimum number of Constituent Stocks from each sector in the Cboe U.S. Large-Mid Cap 100 Index:

- 1) Calculate Total Aggregate Index Universe Market Capitalization: Calculate the sum of the market capitalizations of all stocks in the Index Universe (the "Aggregate Index Universe Capitalization"). For any company that is represented by multiple share classes, the share class with the greatest individual market capitalization will have its market capitalization set to the aggregate market capitalization of all share classes for the given company. Therefore, any company with multiple share classes will only be represented once in the Index Universe, but the aggregation of all its share classes will be used in the calculation of such company's total market capitalization.
- 2) <u>Calculate the Aggregate Sector Capitalization:</u> Using the industry sector names and codes provided by MGECS and the Morningstar US Large-Mid Cap Index, determine the sum of the capitalization of all stocks in each industry sector; this is the sector's Aggregate Sector Capitalization. The sum of all Aggregate Sector Capitalizations shall be equal to the Aggregate Index Universe Capitalization.
- 3) <u>Determine Initial Sector Weights:</u> Determine each sector's initial weighting in the final 500 constituents' stocks by dividing that sector's Aggregate Sector Capitalization by the Aggregate Universe Capitalization. This will yield percentages for each sector referred to as the Actual Sector Weight. For each sector, take its Actual Sector Weight and round down to the nearest whole percentage, then multiply the value by 100. This will create the Integer Sector Weight. For each sector, the sector's Integer Sector Weight will be the minimum number of stocks to be represented in the CEQX Index (the "Minimum Sector Allocation"). However, due to the rounding-down process, the total Integer Sector Weight will result in fewer than 100 stocks.

$$Actual \ Sector \ Weight = \frac{Aggregate \ Sector \ Capitalization}{Aggregate \ Universe \ Capitalization}$$

Initial Sector Weight = Actual Sector Weight rounded down to nearest whole percent

 $Minumum\ Sector\ Allocation\ =\ Initial\ Sector\ Weight\ x\ 100$



4) <u>Determine Each Sector Residual Error:</u> For each industry sector, its Sector Residual Error will be the difference between its Actual Sector Weight and its Integer Sector Weight.

Sector Residual Error = Actual Sector Weight - Initial Sector Weight

- 5) Rank Sectors by Residual Error: Rank each sector by its Residual Error from the largest to smallest. The Sector Residual Errors will be used to determine which sectors are allocated additional stocks to fill out the 100 Constituent Stocks in the CEQX Index. If more than 1 sector residual error ranks the same, then we allocate to the sector with the higher market cap.
- 6) Add Additional Stocks based on Residual Errors: Sum the Minimum Sector Allocations for all sectors. Then, starting with the sector with the largest Residual Error, allocate only one additional stock to that sector and continue to add one additional stock to the sector with the next largest Residual Error until the total number of allocated Constituent Stocks equals 100. The resulting number of Constituent Stocks in each sector will be that sector's Final Sector Constituent Count.

The table below summarizes a sample industry sector weighting calculation and ranking for an index rebalance on September 17, 2024, using MGECS data.

	Industry Sector Capitalizations and Weightings (09/17/2024)								
MGECS Sector ID	MGECS Sector Name	Agg. Sector Capitalization (B)	Actual Sector Weight	Actual Sector Weight %	Min. Stock Alloc. (Int. Sector Weight)	Residual Error	Error Rank	Add'l Stocks	Final Stock Alloc.
101	Basic Materials	1,119.54	0.02197	2.20%	2	-0.20%	10	0	2
102	Consumer Cyclical	5,365.14	0.10528	10.53%	10	-0.53%	4	+1	11
103	Financial Services	6,675.78	0.13099	13.10%	13	-0.10%	11	0	13
104	Real Estate	1,138.66	0.02234	2.23%	2	-0.23%	9	0	2
205	Consumer Defensive	3,246.85	0.06371	6.37%	6	-0.37%	7	0	6
206	Healthcare	5,938.75	0.11653	11.65%	11	-0.65%	3	+1	12
207	Utilities	1,233.91	0.02421	2.42%	2	-0.42%	6	0	2
308	Communication Services	4,530.14	0.08889	8.89%	8	-0.89%	1	+1	9
309	Energy	1,687.83	0.03312	3.31%	3	-0.31%	8	0	3
310	Industrials	3,975.98	0.07802	7.80%	7	-0.80%	2	+1	8
311	Technology	16,050.13	0.31494	31.49%	31	-0.49%	5	+1	32
Total		50,962.71	1.00	100.00%	95	-5.00%		+5	100

Step 3: Determine the Final Constituent Stocks in the CEQX

Within each sector, all stocks will be ranked based on their total market capitalization from largest to smallest. The final Constituent Stocks for that sector will be selected in order based on rank from the largest market capitalization being selected first until the Final Sector Constituent Count has been reached. This process will be repeated for each sector and will result in 100 Constituent Stocks.

In the event that the aggregate market capitalization of all share classes of a company is sufficient to qualify for inclusion in any sector of the Cboe U.S. Large-Mid Cap 100 Index, such company will be represented in the Cboe U.S. Large-Mid Cap 100 Index by that share class with the greatest market capitalization. However, in no event can a company with multiple share classes be represented more than once in Cboe U.S. Large-Mid Cap 100 Index.

There will always be 100 Constituent Stocks in the CEQX Index. For additional information regarding Constituent Stocks' corporate action adjusted values in the Index, please refer to the Appendix.

Step 4: Determine each Constituent Stock's Allocated Shares (Inception & Rebalance Dates)

After the 100 Final Constituent Stocks have been selected in Step 3, the CEQX Index calculation will determine an initial number of shares for each of the 100 Constituent Stocks. Such number of shares are intended to make the initial value of each of the Constituent Stocks in the Index equal to \$10 USD on the rebalance date (for each Constituent Stock its initial "Allocated Shares"). Therefore, the number of initial Allocated Shares for each Constituent Stock will be set on the rebalance date and will equal \$10 USD divided by the closing price of such Constituent Stock on the rebalance date, as adjusted for any pending corporate actions. Thereafter, to capture the total reinvested return of each Constituent Stock, each Constituent Stock's Allocated Shares will be subject to change at each Business Day close to reflect pending corporate actions of that Constituent Stock on next scheduled trading day (the ex-date for such corporate action), as further described in Appendix 1 herein.

After the close of business on any rebalance date, the Cboe U.S. Large-Mid Cap 100 Index Constituent Stocks are reset by the selection methodology described herein. Hence, the Cboe U.S. Large-Mid Cap 100 Index value will reset to the notional amount of 1,000. This amount will be evenly distributed across the 100 Constituent Stocks, with \$10 USD allocated into each new Constituent Stock.

Step 5: LEADX & LAGX Dynamic Reassignment

At the close of business on any rebalance date, the Cboe U.S. Lead 50 Index and the Cboe U.S. Lag 50 Index values are reset to 500.0. Since CEQX acts as a feed index to the LEADX and LAGX indices, each Constituent Stock's allocated shares and price in the LEADX or LAGX at a given observation time can be matched to its contribution to the overall CEQX value. Hence, each Constituent Stock's reinvested total return from the rebalance date (its "value") shall be re-calculated to include any changes in price, dividend activity, and corporate actions (as is outlined in the Appendix 1 and in the CEQX construction steps). Each Constituent Stock's



value will be continuously ranked within the Cboe U.S. Lead 50 Index and the Cboe U.S. Lag 50 Index respectively, and as a result, the Constituent Stocks within each of these Indices are dynamically reassigned every 15 seconds¹.

3 Pricing Information

The real-time Index values are calculated using consolidated prices from the U.S. equity exchanges. If one or multiple of the U.S. equity exchanges are closed, prices from the exchanges that are open will be used. If a Constituent Stock does not have prices at the time of the real-time Index calculation, the last confirmed price is used.

The closing value of the Indices are calculated using the closing prices from each Constituent Stock's primary exchange. If a closing price of a Constituent Stock's primary exchange is not available on any Index calculation day, the closing price of the previous calculation day will be used in the Index close calculations.

4 Index Calculations

4.1 Cboe U.S. Large-Mid Cap 100 Index Calculation

The generalized formula used in the Cboe U.S. Large-Mid Cap 100 Index calculation is:

$$CEQX_t = \sum_{i=1}^{100} S_{i,t} \times P_{i,t}$$

where:

- $CEQX_t$ is the total value of the 100 Constituent Stocks (based on their total return in the Index universe since the most recent rebalance date);
- $S_{i,t}$ is the number of Allocated Shares of Constituent i at time t (including dividends and corporate actions as further described herein);
- $P_{i,t}$ is the market price of Constituent i at time t;
- *i* refers to the *i-th* Constituent Stock;
- t refers to calculation time (if t = after market close on the rebalance date, then CEQX $_t$ = 1000 immediately after the rebalance).

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¹ In case there is a tie between Constituent Stocks, the Constituent Stocks will be allocated to the LEADX and LAGX through ranking the Constituent Stock ticker by alphabetical order, for the LEADX and LAGX to maintain 50 Constituent Stocks each. This is due to the returns based and equally weighted nature of these indices.

4.2 Cboe U.S. Lead 50 Index Calculation

The generalized formula used in the Cboe U.S. Lead 50 Index calculation is:

$$LEADX_t = \sum_{i=1}^{50} S_{i,t} \times P_{i,t}$$

where:

- $LEADX_t$ is the total value of the 50 best performing Constituent Stocks (based on their total return) in the Cboe U.S. Large-Mid Cap 100 Index since the rebalance date. Cboe 100 Constituent Stocks ranked 1 to 50, inclusive;
- $S_{i,t}$ is the number of Allocated Shares of Constituent i at time t (including dividends and corporate actions as further described herein);
- $P_{i,t}$ is the market price of Constituent *i* at time *t*;
- i refers to the i-th Constituent Stock;
- t refers to calculation time (if t = after market close on the rebalance date, then LEADX $_t$ = 500 immediately after the rebalance).

4.3 Cboe U.S. Lag 50 Index Calculation

The generalized formula used in the Cboe U.S. Lag 50 Index calculation is:

$$LAGX_t = \sum_{i=51}^{100} S_{i,t} \times P_{i,t}$$

where:

- $LAGX_t$ is the total value of the 50 worst performing Constituent Stocks (based on their total return) in the Cboe U.S. Large-Mid Cap 100 Index since the rebalance date. Cboe 100 Constituent Stocks ranked 51 to 100, inclusive;
- $S_{i,t}$ is the number of Allocated Shares of Constituent i at time t (including dividends and corporate actions as further described herein);
- $P_{i,t}$ is the market price of Constituent i at time t;
- *i* refers to the *i-th* Constituent Stock;
- t refers to calculation time; (if t = after market close on the rebalance date, then LAGX $_t$ = 500 immediately after the rebalance).

5 Calculation and Dissemination

The Indices are calculated and disseminated as follows on each Business Day.

Index Name	Index Ticker	Dissemination Frequency	Dissemination Hours	End-of-Day Close Value Dissemination
Cboe U.S. Large-Mid Cap 100 Index	CEQX	Every 15 seconds	Between 9:30 a.m. and 4:00 p.m. ET	After 4.20 p.m. ET
Cboe U.S. Lead 50 Index	LEADX	Every 15 seconds	Between 9:30 a.m. and 4:00 p.m. ET	After 4.20 p.m. ET
Cboe U.S. Lag 50 Index	LAGX	Every 15 seconds	Between 9:30 a.m. and 4:00 p.m. ET	After 4.20 p.m. ET

6 Index Information

Index Name	Index Ticker	Base Date	Launch Date	Base Value	Currency
Cboe U.S. Large-Mid Cap 100 Index	CEQX	December 19, 2014	December 20, 2024	1000	USD
Cboe U.S. Lead 50 Index	LEADX	December 19, 2014	February 19, 2025	500	USD
Cboe U.S. Lag 50 Index	LAGX	December 19, 2014	February 19, 2025	500	USD

7 Appendix 1 – Index Construction Specifications

Assigning Sector Weights and Minimum Number of Constituents

To determine the minimum number of Constituent Stocks from any sector in the Cboe U.S. Large-Mid Cap 100 Index, each company within the Index Universe must be assigned to one designated industry sector. These sectors are classified by Morningstar based on their MGECS Sector designation. The number of major industry sectors identified by Morningstar has been, and in the future may be, subject to change. MGECS major sectors names and their respective IDS are referenced in the MGECS methodology document, as referenced in section 1.2.

The sum of the market capitalizations of all stocks in the Index Universe assigned to each Morningstar MGECS sector will be established on the close of the Index Determination Date, and the aggregate total market capitalization of all company names assigned to each sector will be the relevant sector's **Aggregate Sector Capitalization**.

The sum of the market capitalizations of all stocks in the Index Universe shall be determined on the close of the Index Determination Date, and such value will be the **Aggregate Universe Capitalization**.

Corporate action adjustments (Dividends)

When a company pays a dividend (ordinary or special), the value of the dividend is reinvested into the Constituent Stock's shares and the share price is decreased by the value of the dividend, based on the gross



amount, on the close before ex-date. This will be done by an adjustment to the Allocated Shares for such Constituent Stock.

Corporate action adjustments (Stock splits / Reverse Stock Splits):

In the event of a stock split or a reverse stock split, the CEQX Index will adjust the affected Constituent Stock's Allocated Shares and price by the stock-split ratio on the open of the ex-date.

Corporate action adjustments (Mergers, Acquisitions):

The value of mergers and acquisitions are assumed to be fully reflected in the observable market price of the securities.

If a Constituent Stock merges or is acquired, then the target stock will be replaced by a placeholder security to hold fixed cash value. The placeholder security's value will be set to the target stock's last traded price and Allocated Shares. Thus, the target stock's return is only tracked from the rebalance date to the acquisition date (ex-date) and would then become its cash value thereafter.

Corporate action adjustments (Spin-offs):

On the ex-date of a corporate spin-off, the value of Constituent Stock will be the sum of the values of all assets ("Consideration") given to a shareholder as of the ex-date. If a when-issued trading price exists as the observable closing price, then the adjustment will be reinvested into the parent Constituent Stock on the ex-date. Otherwise, upon the close of trading on the ex-date, the value of any Consideration with an observable closing market price will be treated as a special dividend of the original Constituent Stock and will result in an adjustment to the number of Allocated Shares on the day after ex-date. The spun-off company is not included in the Cboe U.S. Large-Mid Cap 100 Index.

If a spin-off results in two or more classes of stock of equal or nearly equal value, shares of the class of stock with the greatest market capitalization will be chosen as the surviving Constituent Stock. In the event of equal market capitalization of two or more share classes, the share class with the greatest market capitalization shall be deemed the surviving Constituent Stock.

Corporate Action Adjustments (Distribution of Rights)

On the ex-date of any corporate action that results in the distribution of rights, the Cboe U.S. Large-Mid Cap 100 Index will follow Morningstar's Alternative Weighted standard corporate action treatment (referenced in section 1.2 of this document), determining whether rights are in the money.

Corporate action adjustments (Constituent Stock Delisting)

In the event a Constituent Stock is delisted, then the delisted stock will be replaced by a placeholder security to hold fixed cash value. The placeholder security's value will be set to the delisted stock's last traded price, at the time of delisting, and Allocated Shares.



8 Appendix 2 – Index Examples

The table below demonstrates sample corporate actions on arbitrary Constituent Stocks and the impact on total Index level prior and post corporate action adjustment.

	Sample Corporate Actions Impact on Index Level (6 Constituent Stocks Only for Illustration Purposes)									
Stock Name	Stock Price	Alloc. Shares	Index Contribution	Corporate Action (CA)	CA Rate	Adj. Stock Price	Adj. Alloc. Shares	% Price Change	EOD Stock Price	Adj. Index Contri.
Stock A	\$ 14.62	0.6840	\$ 10.00	None	0	\$ 14.62	0.6840	0.80%	\$ 14.74	\$ 10.08
Stock B	\$ 852.84	0.0117	\$ 10.00	Stock Split	4:1	\$ 213.21	0.0468	2.20%	\$ 217.90	\$ 10.22
Stock C	\$ 3,115.64	0.0032	\$ 10.00	M&A Acquiror (Reflected)	0	\$ 3,115.64	0.0032	-5.43%	\$ 2,946.46	\$ 9.46
Stock D	\$ 151.16	0.0662	\$ 10.00	M&A Target (Frozen)	Frozen	\$ 151.16	0.0662	0.00%	\$ 151.16	\$ 10.00
Stock E	\$ 92.27	0.1084	\$ 10.00	Spin-Off	\$ 5.00	\$ 87.27	0.1146	-2.00%	\$ 85.52	\$ 9.80
Stock F	\$ 305.06	0.0032	\$ 10.00	Dividend	\$ 8.75	\$ 296.31	0.0337	3.10%	\$ 305.50	\$ 10.31
	Index Level		60.00							59.87

- Stock A has no Corporate Action impacting the allocated shares or stock price.
- Stock B has a 4:1 stock split which results in the allocated shares to be increased by a rate of 4 and the stock price to be decrease by the same factor.
- Stock C (Acquiror) is acquiring Stock D (target) which results in Stock's D contribution to the Cboe U.S. Large-Mid Cap 100 Index to be frozen until the next rebalance date. Stock C's index contribution is not impacted.
- Stock E has a spin-off value of \$5 which results in a decrease in the stock price as well as an increase in the number of allocated shares..
- Stock F has a dividend of \$8.75 which results in a decrease in the stock price as well as an increase in the number of allocated shares.

9 Appendix 3 - Changes

Major changes described in this document since December 20, 2024, are as follows:

Change Summary	Effective Date	Previous Language	Updated Language
Extension of back-tested history	July 23, 2025	The Indices were launched with back-tested history beginning in September 2024.	Back-tested history from December 2014 to September 2024 has been appended to the Indices.
Updated reference to Morningstar's standard corporate action treatment applicable to Appendix I's Distribution of Rights section	July 14, 2025	Appendix 1: Corporate Action Adjustments (Distribution of Rights) On the ex-date of any corporate action that results in the distribution of rights, the Cboe U.S. Large-Mid Cap 100 Index will follow Morningstar's Float Market-Cap Weighted standard corporate action treatment (referenced in section 1.2 of this	Appendix 1: Corporate Action Adjustments (Distribution of Rights) On the ex-date of any corporate action that results in the distribution of rights, the Cboe U.S. Large-Mid Cap 100 Index will follow Morningstar's Alternative Weighted standard corporate action treatment (referenced in section 1.2 of this document),



Change Summary	Effective Date	Previous Language	Updated Language
		document), determining whether rights are in the money.	determining whether rights are in the money.
Addition of LEADX and LAGX indices to Cboe U.S. Large-Mid Cap Indices Methodology	February 19, 2025	-	-

10 Appendix 4 – Document Information

Version Number	3.0
Last Revised Date	July 23, 2025



Disclosures and Disclaimers Related to Choe Indices

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