

## INDEX METHODOLOGY

### INTRODUCTION

#### Northern Trust

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This document sets forth the methodology for the Northern Trust Quality Large Cap Index.

The Index is calculated and disseminated by Refinitiv, and had an inception date of July 31, 2015 at a base index value of 1000.

### OVERVIEW

#### Northern Trust Quality Large Cap Index

The Northern Trust Quality Large Cap Index is designed to measure the performance of a universe of large capitalization securities<sup>i</sup> which demonstrate characteristics of better quality<sup>ii</sup>, attractive valuation<sup>iii</sup> and positive momentum<sup>iv</sup>.

### INDEX ELIGIBILITY

In order to be eligible for inclusion in the Northern Trust Quality Large Cap Index, a security must be a top 600 corporation, as measured by largest float adjusted market capitalization, within the Northern Trust 1250 Index at the time of the annual reconstitution in August<sup>v</sup>.

### DETAILED METHODOLOGY

The construction of the Index begins with a universe of eligible securities (defined in “Index Eligibility” section). Eligible securities are then optimized to maximize exposure to the following factors:

- Quality, as defined by our proprietary scoring model<sup>vi</sup>
- Value
- Momentum

The main objective of the optimization is to maximize exposure to the composite of factors (quality score + value + momentum) while minimizing the overall risk of the index relative to the eligible universe, as measured by standard risk models<sup>vii</sup>. In addition to the main objective, the optimization seeks to manage systematic risk utilizing several constraints. These constraints include (bounds shown as relative weightings to the eligible universe, unless noted otherwise):

- Security level constraint: (+/- 2%)
- Liquidity<sup>viii</sup> constraint: to limit an index a constituent’s maximum weight in the index to its equivalent weight in the eligible universe, when its the constituent’s liquidity score in the eligible universe falls in the bottom decile of the eligible universe



- Minimum absolute constituent constraint: to require that each index constituent has a weight of at least two basis points (0.02%)
- Minimum absolute turnover constraint: to require that index turnover at the constituent level is larger than two basis points (0.02%) for each change made during the reconstitution
- Industry constraint: (+/- 3%)
- Sector constraint: (+/- 3%)
- Beta constraint: (+/- 5%)
- Turnover constraint: to limit the maximum turnover to approximately 20% on any reconstitution date

All of the systematic risk constraints are placed in the constraint hierarchy so when a solution is not feasible due to hard constraints, a relaxed solution can be found.

Any changes to this methodology will be announced to clients at least sixty (60) days in advance prior to becoming effective.

### RECONSTITUTION & REBALANCING

The Northern Trust Quality Large Cap Index is reconstituted quarterly (i.e. February, May, August, and November) and adjusted intra-period only in connection with errors, securities' eligibility, exchange connectivity, float changes and corporate actions, including, but not limited to, initial public offerings and spin-offs.

The index's quarterly reconstitution occurs on the last business day of the month in which the U.S. equity markets are open for a full day of trading<sup>ix</sup>, and becomes effective immediately after the close. The Northern Trust Quality Large Cap Index reserves the right to postpone each reconstitution date for up to one week with prior client notification of such a postponement.

All changes to constituents and weightings will be announced to clients at least two (2) days prior to reconstitution or rebalancing and with definitive weights after the close of the reconstitution or rebalancing date and before the following day's market opening.

### INDEX MAINTENANCE / CORPORATE ACTION-DRIVEN CHANGES

The Indexes will adopt all corporate action related policies and procedures used by Refinitiv. A complete list of Refinitiv's methodology is available by request at [NT\\_Index\\_Services@ntrs.com](mailto:NT_Index_Services@ntrs.com)

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*Disclaimer: Returns of the indexes do not typically reflect the deduction of investment management fees, trading costs or other expenses. It is not possible to invest directly in an index. Indexes are the property of their respective owners, all rights reserved.*

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<sup>i</sup> Based on float-adjusted market capitalization

<sup>ii</sup> This factor seeks to identify companies that exhibit financial strength and stability relative to the market, a characteristic which we define as quality

<sup>iii</sup> The value factor is defined as the current worth of a company relative to its own historical value, book value, or valuation versus peers. Commonly used valuation metrics include: book-to-market value, price-to-earnings ratios, and enterprise value to earnings before, interest taxes, depreciation and amortization. Our optimization sequence seeks to maximize exposure to securities trading at lower valuations.

<sup>iv</sup> The momentum factor reflects market sentiment defined as the slope of a stock's price or other commonly used metrics measured over a given period of time. Our optimization sequence seeks to maximize exposure to securities with positive momentum.

<sup>v</sup> Eligibility and constituent weights within the top 600 corporations in the Northern Trust 1250 Index are adjusted intra-period only in connection with price changes, float adjustments, and corporate action events.

<sup>vi</sup> The core components of the proprietary score are based on quantitative ranking of various metrics obtained from company filings. These scores have three components: Management Efficiency (e.g. corporate finance activities), Profitability (e.g. assess the reliability and the sustainability of financial performance), and Cash Flow (e.g. cash flow generation)

<sup>vii</sup> Risk models are a statistical application which helps provide predictive risk estimates, by quantitatively de-constructing individual equity price movements and attributing those movements to common investment categories (e.g. Sector, industry, style, etc.). The use of standard risk models in our process provides an additional layer of constraints on our optimization outcome, and assists in reducing the index's overall active risk exposure to any one single factor.

<sup>viii</sup> Liquidity of an asset measures the extent to which that asset can be bought or sold in the market without impacting the price of the asset. Examples of some commonly used liquidity measures include but are not limited to: Share Turnover (number of shares traded divided by the total number of shares outstanding), Average Daily Volume (number of shares traded divided by a period of time), and Bid-Ask Spread (the difference or spread between the price a buyer is willing to pay for an asset, and the price a seller is willing to accept for an asset).

<sup>ix</sup> Per the holiday calendar located at [nyse.com](http://nyse.com)

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