

INDEX METHODOLOGY

Northern Trust
50 South La Salle Street
Chicago, Illinois 60603
Nt_index_services@ntrs.com
northerntrust.com

INTRODUCTION

This document sets forth the methodology for the Northern Trust High Yield Value-Scored US Corporate Bond Index (the “Index”).

The Index is calculated and disseminated by Intercontinental Exchange Data Services (ICE), and had an inception date of April 30, 2018 at a base index value of 1000.

OVERVIEW

Northern Trust High Yield Value-Scored US Corporate Bond Index

The Northern Trust High Yield Value-Scored US Corporate Bond Index is designed to measure the performance of a diversified universe of high yield, US-dollar denominated bonds of companies exhibiting favorable fundamental qualities, market valuations and liquidity, as defined by Northern Trust Investments, Inc.’s (“NTI”) proprietary scoring models.

INDEX ELIGIBILITY

In order to be eligible for inclusion in the Northern Trust High Yield Value-Scored US Corporate Bond Index, each bond issue must be:

- A constituent of the Northern Trust High Yield US Corporate Bond Index (the “eligible universe”)

DETAILED METHODOLOGY

The construction of the Index begins with a securities screen to determine eligible securities (as described in the “Index Eligibility” section). Once all eligible securities have been identified, the securities are then optimized based on their exposure to quantitative factors such as:

- Value-Scoreⁱ, Credit-Scoreⁱⁱ, and Liquidity Scoreⁱⁱⁱ, as determined by NTI’s Quantitative Research team’s proprietary scoring models

The primary objective of the optimization is to maximize exposure to the value-score factor relative to the eligible universe. In addition to that objective, systematic risk is managed during the optimization through the use of several constraints. These constraints are listed below (bounds show as relative weightings unless otherwise noted):

- Issuer level constraint: to limit each issuer's absolute weight to 5% or less
- Sector constraint: to limit the Index's maximum or minimum sector weight exposure to +/-8% versus the eligible universe at each reconstitution
- Effective Duration^{iv}: to constrain the Index's effective duration to +/- 0.10 versus the eligible universe at each reconstitution
- Proprietary Credit-Score constraint: to remove bonds ranking in the lowest decile of the proprietary score
- Proprietary Liquidity Score constraint: to restrict new issuances that fall in the bottom 5% of liquidity within each sector, per the proprietary score, at each reconstitution
- Turnover constraint: to limit the Index's turnover at each reconstitution to 15%

All the systematic risk constraints are placed in the constraint hierarchy so when a solution is not feasible due to hard constraints, a relaxed solution is 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 High Yield Value-Scored US Corporate Bond Index is reconstituted monthly^v on the last business day of the month in which U.S. bond markets are open for trading^{vi}, and becomes effective immediately after the market close. Intra-period adjustments may be made at the discretion of NTI in connection with errors, changes in eligibility, and corporate actions.

The Northern Trust High Yield Value-Scored US Corporate Bond 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 the reconstitution or rebalancing date, and again with definitive weights after the close of the reconstitution or rebalancing date, before the following business day's market open.

ⁱ The core components of the proprietary value scoring model are based on quantitative ranking of various metrics obtained from company filings with the SEC, as well as recent price activity. The scores have multiple components, and include but are not limited to the following: Valuation (e.g. to assess the relative value of the security versus other similar securities), Spread Analysis (e.g. to assess the risk/return trade-off associated with each security versus other similar securities) and Solvency (e.g. to assess the corporation's short term and long term solvency and also its risk of default).

ⁱⁱ The core components of the proprietary credit scoring model are based on quantitative ranking of various metrics obtained from company filings with the SEC and recent price activity. These scores have three

components: Management Expertise (e.g. corporate finance activities), Profitability (e.g. assess the reliability and sustainability of financial performance) and Solvency (short and long term).

ⁱⁱⁱ The core components of the proprietary liquidity score are based on a quantitative ranking of security characteristics obtained from company filings with the SEC. Examples of data sets utilized to determine liquidity include but are not limited to: time to maturity (e.g. time until the security reaches its maturity date as measured in years), total issuer debt outstanding (e.g. the sum of all debt outstanding for a single corporate issuer), and time since original issuance (e.g. the time that has elapsed since the security was originally issued as measured in years).

^{iv} A measure of the sensitivity of the price of a bond to a change in interest rates, adjusted for embedded options, and commonly utilized to evaluate a bond's theoretical change in value given a shift in the yield curve.

^v Data used to strike the forward index is locked down for construction purposes eight business days prior to month end.

^{vi} Per the US holiday schedule posted at www.sifma.org/services/holiday-schedule/

NORTHERN TRUST INVESTMENTS (NTI) DISCLAIMER:

THE NTI INDEXES ARE THE EXCLUSIVE PROPERTY OF NTI. NTI AND NTI INDEX NAMES ARE SERVICE MARK(S) OF NTI OR ITS AFFILIATES.

ALTHOUGH NTI SELF-INDEXING GROUP SHALL OBTAIN INFORMATION FOR INCLUSION IN OR USE IN THE CALCULATION OF THE INDEXES FROM SOURCES WHICH NTI SELF-INDEXING GROUP CONSIDERS RELIABLE, NONE OF THE NTI SELF-INDEXING GROUP WARRANTS OR GUARANTEES THE ORIGINALITY, ACCURACY AND/OR THE COMPLETENESS OF ANY NTI INDEX OR ANY DATA INCLUDED THEREIN. NONE OF THE NTI SELF-INDEXING GROUP MAKES ANY WARRANTY, EXPRESS OR IMPLIED, AS TO RESULTS TO BE OBTAINED BY THE ACCOUNT OR FINANCIAL PRODUCT, OR ANY OTHER PERSON OR ENTITY FROM THE USE OF ANY NTI INDEX OR ANY DATA INCLUDED THEREIN. NONE OF THE NTI SELF-INDEXING GROUP SHALL HAVE ANY LIABILITY FOR ANY ERRORS, OMISSIONS OR INTERRUPTIONS IN CONNECTION WITH ANY INDEX OR ANY DATA INCLUDED THEREIN. FURTHER, NONE OF THE NTI SELF-INDEXING GROUP MAKES ANY EXPRESS OR IMPLIED WARRANTIES OF ANY KIND, AND THE NTI SELF-INDEXING GROUP HERBY EXPRESSLY DISCLAIM ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO EACH NTI INDEX AND DATA INCLUDED THEREIN, WITHOUT LIMITING ANY OF THE FOREGOING, IN NO EVENT SHALL ANY OF THE NTI PARTIES HAVE ANY LIABILITY FOR ANY DIRECT, INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL OR ANY OTHER DAMAGES (INCLUDING LOST PROFITS) EVEN IF NOTIFIED OF THE POSSIBILITY OF SUCH DAMAGES.



**NORTHERN
TRUST**

NTAC:3NS-20