

S&P U.S. High Yield Corporate Bond Strategy Indices *Methodology*

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Introduction

Index Objectives and Highlights

The S&P U.S. High Yield Corporate Bond Indices measure the market-value-weighted performance of high yielding corporate bonds. The indices rebalance monthly.

Index Family

S&P U.S. High Yield Select Corporate Bond Index. The index measures the performance of the most liquid bonds in the S&P U.S. High Yield Corporate Bond Index.

S&P U.S. High Yield Low Volatility Corporate Bond Index. The index measures the performance of bonds with potentially lower volatility within the S&P U.S. High Yield Select Corporate Bond Index. The index is market value weighted subject to a 3% cap on any single issuer.

Supporting Documents

This methodology is meant to be read in conjunction with supporting documents providing greater detail with respect to the policies, procedures and calculations described herein. References throughout the methodology direct the reader to the relevant supporting document for further information on a specific topic. The list of the main supplemental documents for this methodology and the hyperlinks to those documents is as follows:

Supporting Document	URL
S&P Dow Jones Indices' Fixed Income Policies & Practices Methodology	Fixed Income Policies & Practices
S&P Dow Jones Indices' Fixed Income Index Mathematics Methodology	Index Mathematics Methodology

This methodology was created by S&P Dow Jones Indices to achieve the aforementioned objective of measuring the underlying interest of the indices governed by this methodology document. Any changes to or deviations from this methodology are made in the sole judgment and discretion of S&P Dow Jones Indices so that the indices continue to achieve their objective.

Eligibility Criteria and Index Construction

Index Eligibility

Index Universe. A bond must be a constituent of the S&P U.S. High Yield Corporate Bond Index (the “underlying universe index”).

For information on the S&P U.S. High Yield Corporate Bond Index, please refer to the S&P Global Bond Indices methodology available at www.spglobal.com/spdji/.

Index Construction

S&P U.S. High Yield Select Corporate Bond Index

- 1. Create the Base Universe.** Bonds in the underlying universe index that satisfy the following criteria are selected to form the “Base Universe index”:
 - **Coupon Type.** Fixed-to-float and zero-coupon bonds are excluded.
 - **Hybrid Securities.** Hybrid securities, securities allowing deferred interest payments, Trust Preferred securities and securities with Tier Capital Codes of AT1, CT1, ST1, ST2, ST3, T1C, T1I, T2, T2L, and T2U are excluded.
 - **Option Adjusted Spread (OAS).** Bonds must have a positive OAS value over the U.S. government bond curve.
 - **Average Score from Credit Rating (ASCR).** The ASCR must be less than 90.5.

For details regarding Tier Capital Codes and the calculation of ASCR, please refer to Appendices I and II, respectively.

- 2. Select Index Composition.** Bonds in the Base Universe that satisfy the following criteria are selected to form the S&P U.S. High Yield Select Corporate Bond Index:
 - **Size.** Current amount outstanding must be greater than US\$ 400 million.¹
 - **Spread Duration.** Spread Duration must be greater than or equal to 0.5.
 - **OAS Rank.** Bonds must have an OAS rank percentage equal to or less than 95%:
 - Bonds in the Base Universe are ranked by OAS values in ascending order.
 - OAS rank percentage is calculated by dividing the rank by the number of bonds in the Base Universe:
$$OAS_Rank_%_{bond\ i} = \frac{OAS_Rank_{bond\ i}}{\# \text{ of bonds in Base Universe}}$$
 - **Issuer’s High Yield Bond Issuances.** Issuers with a total current par amount outstanding in the S&P U.S. High Yield Corporate Bond Index of greater than or equal to US\$ 1 billion are eligible.²

¹ For history prior to 2013, bond size had to be greater than the median size for all bonds in base universe.

² For history prior to 2013, the size of high yield bonds issued by the same issuer had to be greater than or equal to the median of the issuer size for all bonds in the base universe.

- **Age or Size.** Bond age is calculated as follows:

$$\text{Bond Age} = \frac{\text{Rebalancing Reference Date}^3 - \text{Bond Issue Date}}{365.25}$$

- Bond age must be less than or equal to five years, or
- Current par amount outstanding must be greater than or equal to US\$1 billion.⁴

S&P U.S. High Yield Low Volatility Corporate Bond Index

1. **Calculate Marginal Contribution of Risk (MCR).** MCR for each bond in the S&P U.S. High Yield Select Corporate Bond Index is calculated as follows:

- Calculate the market value weight of each bond in the S&P U.S. High Yield Select Corporate Bond Index:

$$\text{Market_Value_}\%_{\text{bond } i} = \frac{\text{Market_Value}_{\text{bond } i}}{\sum_i \text{Market_Value}_{\text{bond } i}}$$

- Calculate the adjusted average OAS for the S&P U.S. High Yield Select Corporate Bond Index (AAOAS_{SU}):

$$\text{AAOAS}_{\text{SU}} = \frac{\sum_i (\text{OAS}_{\text{bond } i} * \text{Spread_Duration}_{\text{bond } i} * \text{Market_Value_}\%_{\text{bond } i})}{\sum_i (\text{Spread_Duration}_{\text{bond } i} * \text{Market_Value_}\%_{\text{bond } i})}$$

- Calculate MCR for each bond in the S&P U.S. High Yield Select Corporate Bond Index:

$$\text{MCR}_{\text{bond } i} = (\text{OAS}_{\text{bond } i} - \text{AAOAS}_{\text{SU}}) * \text{Spread_Duration}_{\text{bond } i}$$

2. **Rank Marginal Contribution of Risk (MCR).**

- Rank bonds in the S&P U.S. High Yield Select Corporate Bond Index by their MCR in ascending order.
- Calculate MCR_Rank_% for each bond as follows:

$$\text{MCR_Rank_}\%_{\text{bond } i} = \frac{\text{MCR_Rank}_{\text{bond } i}}{\# \text{ of bonds in the S\&P U.S. High Yield Select Corporate Bond Index}}$$

3. **Low Volatility Index Composition.** Bonds from the S&P U.S. High Yield Select Corporate Bond Index with MCR_Rank_% between 0% and 50% inclusive, are selected to form the S&P U.S. High Yield Low Volatility Corporate Bond Index.

- **Turnover Buffer:** To reduce turnover, current constituents of the S&P U.S. High Yield Low Volatility Corporate Bond Index are selected if their MCR_Rank_% is between 0 and 60%, inclusive

Weighting Scheme

S&P U.S. High Yield Select Corporate Bond Index. Bonds in the index are market value weighted.

S&P U.S. High Yield Low Volatility Corporate Bond Index. On each rebalancing reference date, bonds in the index are market value weighted, subject to an issuer weight cap of 3%. Following an iterative approach, the excess market value over the 3% cap is redistributed on a pro-rata basis to all the remaining bonds from other issuers that are below the 3% cap.

³ Prior to the December 20, 2016, the rebalancing date was used.

⁴ For history prior to 2013, bond age had to be less than or equal to five years or the bond size had to be within 20% of the largest issues in base universe.

Pricing

LSEG is the designated pricing source. Bonds that are not priced by LSEG are not eligible for index inclusion.

S&P U.S. High Yield Select Corporate Bond Index. Index bonds are priced using the bid price.

S&P U.S. High Yield Low Volatility Corporate Bond Index. New additions to the index enter at the ask price during the pro-forma period and are priced using the bid price starting on the first day of the new composition. For all other bonds, bid pricing is used.⁵

Index Calculations

The total return is calculated by aggregating the interest return, reflecting the return due to paid and accrued interest, and price return, reflecting the gains or losses due to changes in the end-of-day price and principal repayments.

For further details regarding Index Calculations, please refer to S&P Dow Jones Indices' Fixed Income Index Mathematics Methodology available at www.spglobal.com/spdji/.

⁵ Prior to December 20, 2016, only bid prices were used.

Index Maintenance

Monthly Rebalancing

The indices are rebalanced monthly.

On the rebalancing reference date, the composition of the underlying universe index (i.e. the S&P U.S. High Yield Corporate Bond Index) is determined. All terms and conditions and pricing data required to rebalance the indices for the subsequent rebalance period are also obtained as of the rebalancing reference date.⁶ Any market events after this date that affect the constituent membership are reflected on the next rebalancing.

Additions, deletions and other changes to the indices arising from the monthly rebalancing are made provided the security's reference information and pricing are available by designated pricing and data providers on the rebalancing reference dates.⁷

Changes to the indices are published on the announcement date and become effective on the rebalancing date. Information related to the rebalancing is obtained and disseminated after the close of business.

Rebalancing Schedule	
Rebalancing Frequency	Monthly
Rebalancing Date	Last day of the rebalancing period (T)
Announcement Date	T-3
Rebalancing Reference Date	T-4

All days reflect after the close and count business days.

Ongoing Maintenance

For more information on treatment of defaults or lack of daily price data, please refer to the Defaults section of S&P Dow Jones Indices' Fixed Income Policies & Practices Methodology.

Currency of Calculation and Additional Index Return Series

The indices are calculated in U.S. dollars.

Additional currency and currency hedged versions of the indices, as well as maturity, sector and rating-based sub-indices, may be available. For a list of available sub-indices and tickers, please refer to S&P Dow Jones Indices' Fixed Income Index Directory available at www.spglobal.com/spdji/.

For more information on currency and currency hedged indices, please refer to S&P Dow Jones Indices' Fixed Income Index Mathematics Methodology.

⁶ Prior to December 20, 2016, the composition of the underlying universe index and its terms and conditions data were observed three business days prior to the last business day of the month, and the pricing data were as of the last business day of the month.

⁷ Terms and conditions, and pricing data are subject to LSEG data availability.

Base Dates and History Availability

Index history availability, base dates, and base values are shown in the table below.

Index	Launch Date	First Value Date	Base Date	Base Value
S&P U.S. High Yield Select Corporate Bond Index	01/27/2017	12/30/2016	12/30/2016	100
S&P U.S. High Yield Low Volatility Corporate Bond Index	12/19/2016	01/31/2000	01/31/2000	100

Index Governance

Index Committee

An Index Committee maintains the indices. All committee members are full-time professionals at S&P Dow Jones Indices. Meetings are held regularly.

The Index Committee oversees the management of the indices, including determinations of intra-rebalancing changes, maintenance and inclusion policies, and other matters affecting the maintenance and calculation of the indices.

In fulfilling its responsibilities, the Index Committee has full and complete discretion to (i) amend, apply, or exempt the application of index rules and policies as circumstances may require and (ii) add, remove, or by-pass any bond in determining the composition of an index.

The Index Committee may rely on any information or documentation submitted to it or gathered by it that the Index Committee believes to be accurate. The Index Committee reserves the right to reinterpret publicly available information and to make changes to the indices based on a new interpretation of that information at its sole discretion. All Index Committee discussions are confidential.

The Index Committee is separate from and independent of other analytical groups at S&P Global. In particular, the Index Committee has no access to or influence on decisions by S&P Global Ratings analysts.

S&P Dow Jones Indices' Index Committees reserve the right to make exceptions when applying the methodology if the need arises. In any scenario where the treatment differs from the general rules stated in this document or supplemental documents, clients will receive sufficient notice, whenever possible.

In addition to the daily governance of indices and maintenance of index methodologies, at least once within any 12-month period, the Index Committee reviews the methodology to ensure the indices continue to achieve the stated objectives, and that the data and methodology remain effective. In certain instances, S&P Dow Jones Indices may publish a consultation inviting comments from external parties.

For information on Quality Assurance and Internal Reviews of Methodology, please refer to S&P Dow Jones Indices' Fixed Income Policies & Practices Methodology.

Index Policy

Announcements

Announcements of any relevant information pertaining to the indices are made after market close. Press releases are posted on the S&P Dow Jones Indices Web site at www.spglobal.com/spdji/.

Holiday Schedule

The indices are calculated when the Securities Industry and Financial Markets Association (SIFMA®) declares the U.S. fixed income markets to be open.

A complete holiday schedule for the year is available at www.spglobal.com/spdji/.

Rebalancing

The Index Committee may change the date of a given rebalancing for reasons including market holidays occurring on or around the scheduled rebalancing date. Any such change will be announced with proper advance notice where possible.

Index Releases

Releases are issued by S&P Dow Jones Indices at the end of the business day.

Recalculation Policy

For information on the recalculation policy please refer to S&P Dow Jones Indices' Fixed Income Policies & Practices Methodology.

For information on Calculations and Pricing Disruptions, Expert Judgment and Data Hierarchy, please refer to S&P Dow Jones Indices' Fixed Income Policies & Practices Methodology.

Contact Information

For questions regarding an index, please contact: index_services@spglobal.com.

Index Dissemination

Index levels are available through S&P Dow Jones Indices' website at www.spglobal.com/spdji/, major quote vendors (see codes below), numerous investment-oriented websites, and various print and electronic media.

Tickers

The table below lists headline indices covered by this document. All versions of the below indices that may exist are also covered by this document. Please refer to the [S&P DJI Methodology & Regulatory Status Database](#) for a complete list of indices covered by this document.

Total Return Index	Ticker
S&P U.S. High Yield Select Corporate Bond Index	SPUSHYST
S&P U.S. High Yield Low Volatility Corporate Bond Index	SPUSHLVT

Index Data

Daily index level data is available via subscription.

For product information, please contact S&P Dow Jones Indices, www.spglobal.com/spdji/en/contact-us.

Web site

For further information, please refer to S&P Dow Jones Indices' Web site at www.spglobal.com/spdji/.

Appendix I

Definition of Terms

Option Adjusted Spread (OAS). The OAS is the spread over the U.S. government bond curve that the investor receives for assuming various risks net of the cost of the embedded option. OAS is calculated applying a Hull-White one factor short rate model with a volatility term structure fitted to a selected set of ATM swaption volatilities.

Spread Duration. The sensitivity of a bond's price with embedded options to a change in its OAS.

Tier Capital Codes. Tier Capital Codes are defined as follows:

Tier Capital Code	Definition
AT1	Additional Tier 1 Capital (Basel III)
CT1	Common Equity Tier 1 (Basel III)
ST1	Tier 1 (Solvency II)
ST2	Tier 2 (Solvency II)
ST3	Tier 3 (Solvency II)
T1C	Core Tier 1 Capital (Basel II)
T1I	Innovative Tier 1 (Basel II)
T2	Tier 2 Capital (Basel III)
T2L	Lower Tier 2 Capital (Basel II)
T2U	Upper Tier 2 Capital (Basel II)

Appendix II

Calculation of Average Score from Credit Rating

Ratings from each ratings agency are converted to numeric values as detailed in the table below. The Average Score from Credit Rating (ASCR) is calculated as the arithmetic average of the numeric values of the available ratings. If ratings are available from all three ratings agencies, the average score will be calculated from all three ratings. If only two of the ratings agencies rate a bond, the average score is based on an average of the two. If only one rating is available, the average score is the numeric value of that one rating.

S&P	Moody's	Fitch	Score
AAA	AAA	AAA	100
AA+	AA1	AA+	99
AA	AA2	AA	98
AA-	AA3	AA-	97
A+	A1	A+	96
A	A2	A	95
A-	A3	A-	94
BBB+	BAA1	BBB+	93
BBB	BAA2	BBB	92
BBB-	BAA3	BBB-	91
BB+	BA1	BB+	90
BB	BA2	BB	89
BB-	BA3	BB-	88
B+	B1	B+	87
B	B2	B	86
B-	B3	B-	85
CCC+	CAA1	CCC+	84
CCC	CAA2	CCC	83
CCC-	CAA3	CCC-	82
CC	CA	CC+	81
C	CA1	CC	80
	CA2	CC-	79
	CA3	C+	78
		C	77
		C-	76

Appendix III

Methodology Changes

Methodology changes since January 1, 2015 are as follows:

Change	Effective Date (After Close)	Methodology	
		Previous	Updated
Rebalancing Reference Date	03/29/2019	The rebalancing reference date is three days prior to market close of the last business day of the previous month (t-3).	The rebalancing reference date is four days prior to market close of the last business day of the previous month (t-4).
Additional Index Eligibility Exclusions: S&P U.S. High Yield Select Corporate Bond Index	02/28/2017	--	Hybrid securities, securities allowing deferred interest payments, Trust Preferred securities and securities with Tier Capital Codes of AT1, CT1, ST1, ST2, ST3, T1C, T1I, T2, T2L, and T2U are excluded.

Disclaimer

Performance Disclosure/Back-Tested Data

Where applicable, S&P Dow Jones Indices and its index-related affiliates (“S&P DJI”) defines various dates to assist our clients by providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index’s Launch Date are considered back-tested. S&P DJI defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company’s public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed “Date of introduction”) is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index’s public release date.

Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Information presented prior to an index’s launch date is hypothetical back-tested performance, not actual performance, and is based on the index methodology in effect on the launch date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. In addition, forks have not been factored into the back-test data with respect to the S&P Cryptocurrency Indices. For the S&P Cryptocurrency Top 5 & 10 Equal Weight Indices, the custody element of the methodology was not considered; the back-test history is based on the index constituents that meet the custody element as of the Launch Date. Also, the treatment of corporate actions in back-tested performance may differ from treatment for live indices due to limitations in replicating index management decisions. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate certain ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using “Backward Data Assumption” (or pulling back) of ESG data for the calculation of back-tested historical performance. “Backward Data Assumption” is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as “product involvement”) were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on “Backward Data Assumption” please refer to the FAQ. The methodology and factsheets of any index that employs backward assumption in the back-tested history

will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used. Index returns shown do not represent the results of actual trading of investable assets/securities. S&P DJI maintains the index and calculates the index levels and performance shown or discussed but does not manage any assets.

Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the Index or investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US \$100,000 investment for a 12-month period (or US \$10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US \$1,650), the net return would be 8.35% (or US \$8,350) for the year. Over a three-year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US \$5,375, and a cumulative net return of 27.2% (or US \$27,200).

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