S&P Dow Jones Indices

A Division of S&P Global

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

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Introduction

Index Objectives and Highlights

S&P U.S. High Yield Select Corporate Bond Index. The index is measures the performance of U.S. high yield corporate bonds. The index is market value weighted.

S&P U.S. High Yield Low Volatility Corporate Bond Index. The index measures the performance of U.S. high yield corporate bonds. The index is modified market value weighted with a 3% cap on any single issuer.

The indices are comprised of bonds from the S&P U.S. High Yield Corporate Bond Index that meet certain criteria as defined in *Eligibility Criteria and Index Construction* that act as proxies for liquidity and low volatility.

The indices undergo a rebalancing process once a month, with the intent of keeping the index current.

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	Fixed Income 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

For each index, index bonds are drawn from the constituent bonds 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.spdji.com.

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

The index is constructed according to the following steps:

- 1. Create the Base Universe. Bonds in the underlying universe index that satisfy the following criteria are selected and form the base universe:
 - 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.¹
 - 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 the calculation of ASCR, please refer to Appendix II.

- **2. Final Index Composition.** Bonds in the base universe that satisfy the following criteria are selected and form the S&P. U.S. High Yield Select Corporate Bond Index:
 - Size. Current amount outstanding must be greater than US\$ 400 million.²
 - **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. The amount of high yield bonds issued by the issuer must be greater than or equal to US\$ 1 billion. This is calculated as the sum of the current amount outstanding for all bonds by issuer in the S&P U.S. High Yield Corporate Bond Index.³

² For history prior to 2013, bond size had to be greater than the median size for all bonds in base universe.

¹ See Appendix I for Tier Capital Code definitions.

³ 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 must be equal to or less than five years or current amount outstanding must be greater than or equal to US\$1 billion.⁴ Bond age is calculated as follows:

$$Bond\ Age = \frac{Rebalancing\ Reference\ Date^5 - Bond\ Issue\ Date}{365.25}$$

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

The index is constructed according to the following steps:

- 1. Calculate Marginal Contribution of Risk (MCR). MCR for all bonds 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:

$$Market_Value_\%_{bond\ i} = \frac{Market_Value_{bond\ i}}{\sum_{i} Market_Value_{bond\ i}}$$

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

$$AAOAS_{su} = \frac{\sum_{i}(OAS_{bond\;i} * Spread_Duration_{bond\;i} * Market_Value_\%_{bond\;i})}{\sum_{i}(Spread_Duration_{bond\;i} * Market_Value_\%_{bond\;i})}$$

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

$$MCR_{bond i} = (OAS_{bond i} - AAOAS_{su}) * Spread_Duration_{bond i}$$

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

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

2. Final Index Composition. Bonds from the S&P U.S. High Yield Select Corporate Bond Index with MCR_Rank_% between 0 and 50% (including 50%) are selected and form the S&P U.S. High Yield Low Volatility Corporate Bond Index. Bonds selected for the index at the last rebalancing that are also part of the current rebalancing's S&P U.S. High Yield Select Corporate Bond Index remain eligible and are selected for index inclusion if their S&P U.S. High Yield Select Corporate Bond Index MCR_Rank_% is between 0 and 60% (including 60%).

Weighting Scheme

S&P U.S. High Yield Select Corporate Bond Index. Index bonds are market value weighted.

S&P U.S. High Yield Low Volatility Corporate Bond Index. Index bonds are market value weighted, subject to an issuer weight cap whereby any issuer that exceeds 3% of the market value weight of the index is capped at 3%. The excess market value over the 3% cap is redistributed on a pro-rata basis to all the index bonds of the other issuers that are below the 3% cap. The process is repeated until no issuer exceeds the 3% limit. The 3% issuer cap is applied each month on the rebalancing reference date as the index undergoes the rebalancing process.

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.

⁵ Prior to the December 20, 2016, the rebalancing date was used.

Pricing

Thomson Reuters is the designated pricing source. Bonds that are not priced by Thomson Reuters 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.⁶

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.spdii.com.

⁶ Prior to December 20, 2016, only bid prices were used.

Index Maintenance

Monthly Rebalancing

The indices are rebalanced monthly.

The rebalancing reference date is three business days prior to the last business day of the month. On this date, the composition of the underlying universe index (i.e. the S&P U.S. High Yield Corporate Bond Index) is observed. All terms and conditions and pricing data required to rebalance the indices for the subsequent month are also obtained as of the rebalancing reference date.⁷ 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.⁸

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

The indices are also reviewed on an ongoing basis to account for the following:

- When an index bond is in default or misses an interest payment, the price reported by the pricing source is used. However, the Index Committee may determine that the bond be removed from the index at a different price and may specify a price of 0.00. The decision of the Index Committee is final.
- If an index bond is no longer priced by the pricing source, the last available price is used. However, the Index Committee may determine that a different price be used. The decision of the Index Committee is final. For clarity, index bonds that are no longer priced by the pricing source fail to meet the pricing availability factors and are removed at the next rebalancing date. If the bond is priced for at least one of the five business days prior to the rebalancing announcement date, the bond remains in the index. Otherwise, it is removed from the index at the subsequent rebalancing date.

⁷ 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.
⁸ Terms and conditions, and pricing data are subject to Thomson Reuters data availability.

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.spdji.com.

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

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	12/20/2016	01/31/2000	01/31/2000	100

Index Governance

Index Committee

S&P Dow Jones Indices' Fixed Income Index Committee maintains the indices. All committee members are full-time professionals at S&P Dow Jones Indices. Meetings are held quarterly and whenever deemed appropriate.

The Index Committee oversees the management of the indices, including determinations of intrarebalancing 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.spdji.com.

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.spdji.com.

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 <u>www.spdji.com</u>, 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 S&P DJI'S All Indices by Methodology Report 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.spdji.com/contact-us.

Web site

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

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
Α	A2	Α	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
В	B2	В	86
B-	B3	B-	85
CCC+	CAA1	CCC+	84
CCC	CAA2	CCC	83
CCC-	CAA3	CCC-	82
CC	CA	CC+	81
С	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:

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

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