

S&P 500 Rate Sensitivity Indices *Methodology*

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Introduction

Index Objectives and Highlights

S&P 500 Rate Sensitivity Indices. The indices measure the performance of constituents of the S&P 500® (the “Underlying Index”) with weights based on the interest rate sensitivity of the companies. Interest rate sensitivity is defined as the regression of the previous 60 monthly total compound stock returns to monthly changes in the 10-year U.S. treasury yield.

S&P 500 High Rate Sensitivity Indices. The indices overweight companies with comparatively greater 10-year U.S. Treasury interest rate sensitivity while the S&P 500 Low Rate Sensitivity Indices overweight companies with comparatively lesser interest rate sensitivity.

S&P 500 High and Low Rate Sensitivity 100 Indices. The indices select the top 100 companies from the S&P 500 based on positive or negative rate sensitivity respectively. The indices weight constituents by rate sensitivity to interest rates.

For information on the S&P 500, please refer to the S&P U.S. Indices Methodology available at www.spglobal/spdji.com.

Index Family

The index family currently consists of the following:

- S&P 500 High Rate Sensitivity Index
- S&P 500 High Rate Sensitivity 100 Index
- S&P 500 Low Rate Sensitivity Index
- S&P 500 Low Rate Sensitivity 100 Index

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’ Equity Indices Policies & Practices Methodology	Equity Indices Policies & Practices
S&P Dow Jones Indices’ Index Mathematics Methodology	Index Mathematics Methodology
S&P Dow Jones Indices’ Float Adjustment Methodology	Float Adjustment Methodology

This methodology was created by S&P Dow Jones Indices to achieve the aforementioned objective of measuring the underlying interest of each index 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 index continues to achieve its objective.

Eligibility Criteria

Index Eligibility

As of each rebalancing reference date, the indices are constructed from the underlying index.

Multiple Share Classes

The indices employ the following treatment for multiple share class eligibility:

S&P 500 High Rate- Sensitivity Index and S&P 500 Low Rate Sensitivity Index. All publicly listed multiple share class lines are eligible for index inclusion, subject to meeting the eligibility criteria.

S&P 500 High Rate Sensitivity 100 Index and S&P 500 Low Rate Sensitivity 100 Index. Each company is represented once by the Designated Listing.

For more information regarding the treatment of multiple share classes, please refer to Approach A and Approach B, respectively, within the Multiple Share Classes section of the S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

Index Construction

Constituent Selection

As of the rebalancing reference date, all securities in the underlying index are included in the S&P 500 High Rate Sensitivity Index and S&P 500 Low Rate Sensitivity Index. The 100 stocks with the highest rate sensitivity scores are included in the S&P 500 High Rate Sensitivity 100 Index, while the 100 stocks with the most negative rate sensitivity scores are included in the S&P 500 Low Rate Sensitivity 100 Index. If stocks have the same score, priority is given to existing constituents. If two non-constituents share the same score, priority is given to the stock with the larger float-adjusted market capitalization.

The rate sensitivity coefficient is defined as a regression of the previous 60 monthly total compound stock returns to monthly changes in the 10-year U.S. Treasury yield (or all monthly returns if a stock does not have 60 months of trading history). For securities with less than 36 months of trading history, regression is not performed. A stock's z-score is calculated based on the regression (beta) and for the securities with less than 36 months of trading history, the mean z-score of the corresponding sector in the universe is used.

Constituent Weighting

For the S&P 500 High Rate Sensitivity Index and S&P 500 High Rate Sensitivity 100 Index the weight, w , for each constituent, i , is set proportionally to their rate sensitivity score (RSS):

$$w_i = \frac{RSS_i}{\sum_{i=1}^n RSS_i}$$

For the S&P 500 Low Rate Sensitivity Index and S&P 500 Low Rate Sensitivity 100 Index the weight, w , for each constituent, i , is set proportionally to their negative rate sensitivity scores (NRSS), which is

$$w_i = \frac{NRSS_i}{\sum_{i=1}^n NRSS_i}$$

Please refer to Appendix A for regression calculation details and Appendix B for rate sensitivity score calculation details.

Index Calculations

The index is calculated by means of the divisor methodology used in most S&P Dow Jones Indices' equity indices.

For more information on the Non-Market Capitalization Weighted index methodology, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.

Index Maintenance

Rebalancing

The indices rebalance quarterly, effective after the close on the third Friday of January, April, July, and October. The rebalancing reference dates are after the close of the last business day of December, March, June, and September, respectively. Constituents' index shares are calculated using the closing prices five business days prior to the third Friday of the rebalancing month as the reference price. Index shares are calculated and assigned to each stock to arrive at the weights determined on the reference date. Since index shares are assigned based on prices prior to rebalancing, the actual weight of each stock at the rebalancing differs from these weights due to market movements.

Additions and Deletions. Except for spin-offs, additions generally only take place at the quarterly rebalancings. Constituents removed from the underlying index are removed from the respective rate sensitivity index simultaneously.

Spin-Offs. Spin-offs are added to an index on the ex-date. If the spin-off remains in the underlying index, both the parent company and spin-off remain in the index. In cases where the spin-off will not remain in the underlying index, the spun-off company is removed after at least one day of regular way trading.

Corporate Actions

For information on Corporate Actions, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

Other Adjustments

In cases where there is no achievable market price for a stock being deleted, it can be removed at a zero or minimal price at the Index Committee's discretion, in recognition of the constraints faced by investors in trading bankrupt or suspended stocks.

Currency of Calculation and Additional Index Return Series

The indices calculate in U.S. dollars.

In addition to the indices detailed in this methodology, additional return series versions of the indices may be available, including, but not limited to: currency, currency hedged, decrement, fair value, inverse, leveraged, and risk control versions. For a list of available indices, please refer to the [S&P DJI Methodology & Regulatory Status Database](#).

For information on various index calculations, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.

For the inputs necessary to calculate certain types of indices, including decrement, dynamic hedged, fair value, and risk control indices, please refer to the Parameters documents available at www.spglobal/spdji.com.

Base Date 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 500 High Rate Sensitivity Index	12/04/2017	01/21/1994	01/21/1994	1000
S&P 500 High Rate Sensitivity 100 Index	04/06/2020	01/21/1994	01/21/1994	1000
S&P 500 Low Rate Sensitivity Index	04/06/2020	01/21/1994	01/21/1994	1000
S&P 500 Low Rate Sensitivity 100 Index	04/06/2020	01/21/1994	01/21/1994	1000

Index Data

Calculation Return Types

S&P Dow Jones Indices calculates multiple return types which vary based on the treatment of regular cash dividends. The classification of regular cash dividends is determined by S&P Dow Jones Indices.

- Price Return (PR) versions are calculated without adjustments for regular cash dividends.
- Gross Total Return (TR) versions reinvest regular cash dividends at the close on the ex-date without consideration for withholding taxes.
- Net Total Return (NTR) versions, if available, reinvest regular cash dividends at the close on the ex-date after the deduction of applicable withholding taxes.

In the event there are no regular cash dividends on the ex-date, the daily performance of all three indices will be identical.

For a complete list of indices available, please refer to the daily index levels file (“SDL”).

For more information on the classification of regular versus special cash dividends as well as the tax rates used in the calculation of net return, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

For more information on the calculation of return types, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.

Index Governance

Index Committee

An S&P Dow Jones Indices' Index Committee maintains the indices. The Committee meets regularly. At each meeting, the Committee reviews pending corporate actions that may affect index constituents, statistics comparing the composition of the indices to the market, companies that are being considered as candidates for addition to an index, and any significant market events. In addition, the Index Committee may revise index policy covering rules for selecting companies, treatment of dividends, share counts or other matters.

S&P Dow Jones Indices considers information about changes to its indices and related matters to be potentially market moving and material. Therefore, all Index Committee discussions are confidential.

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' Equity Indices Policies & Practices Methodology.

Index Policy

Announcements

All index constituents are evaluated daily for data needed to calculate index levels and returns. All events affecting the daily index calculation are typically announced in advance via the Index Corporate Events report (.SDE), delivered daily to all clients. Any unusual treatment of a corporate action or short notice of an event may be communicated via email to clients.

For more information, please refer to the Announcements section of S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

Pro-forma Files

In addition to the corporate events file (.SDE), S&P Dow Jones Indices provides constituent pro-forma files each time the index rebalances. The pro-forma file is typically provided daily in advance of the rebalancing date and contains all constituents and their corresponding weights and index shares effective for the upcoming rebalancing.

Please visit www.spglobal/spdji.com for a complete schedule of rebalancing timelines and pro-forma delivery times.

Holiday Schedule

The index is calculated daily, throughout the calendar year. The only days the index is not calculated are on days when all exchanges where the index's constituents are listed are officially closed.

A complete holiday schedule for the year is available on S&P Dow Jones Indices' Web site at www.spglobal/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.

Unexpected Exchange Closures

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

Recalculation Policy

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

For information on Calculations and Pricing Disruptions, Expert Judgment and Data Hierarchy, please refer to S&P Dow Jones Indices' Equity Indices 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' Web site at www.spglobal/spdji.com, major quote vendors (see codes below), numerous investment-oriented Web sites, 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.

Index	Return Type	Bloomberg	Refinitiv
S&P 500 High Rate Sensitivity Index (USD)	Price Return	SP5RRUP	.SP5RRUP
	Total Return	SP5RRUT	.SP5RRUT
S&P 500 High Rate Sensitivity 100 Index	Price Return		
	Total Return		
S&P 500 Low Rate Sensitivity Index	Price Return		
	Total Return		
S&P 500 Low Rate Sensitivity 100 Index	Price Return		
	Total Return		

Index Data

Daily constituent and index level data are available via subscription.

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

Web site

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

Appendix A

Rate Sensitivity Coefficient Calculation

As of the rebalance reference date, rate sensitivity coefficients are determined by a regression of the previous 60 monthly total compound stock returns to monthly changes in the 10-year U.S. treasury yield (or all monthly returns if a stock does not have a 60-month history). The rate sensitivity coefficient, β_{RS} , is the slope coefficient of the 10-year U.S. treasury yield, Y_t , variable in the below equation:

$$R_{i,t} = Int_i + \beta_{RS,i} (Y_t)$$

where:

$R_{i,t}$	=	monthly return for security i in month t
Int_i	=	intercept of security i
$\beta_{RS,i}$	=	coefficient of security i to 10-year U.S. treasury yield
Y_t	=	change in 10-year U.S. treasury yield during month t

Outlier Handling and Winsorization. Outlier coefficients are winsorized to ensure that the values used to calculate the rate sensitivity score is less distorted by extreme values.

- The values for all securities are first ranked in ascending order. Then, for securities that lie above the 97.5 percentile rank or below the 2.5 percentile rank, their value is set as equal to the value of the 97.5 percentile ranked or the 2.5 percentile ranked security, whichever is applicable.

Appendix B

Z-score & Rate Sensitivity Score Computation

Z-score Computation. Computing a z-score is a widely adopted method of standardizing a variable. After winsorizing the rate sensitivity coefficient, the z-score for each security is calculated using the mean and standard deviation of the rate sensitivity coefficients in the universe.

The z-score is calculated as follows:

$$z_{\alpha} = \frac{(x_{\alpha} - \mu_{\alpha})}{\sigma_{\alpha}}$$

where:

- z_{α} = Z-score for a given security
- x_{α} = Winsorized variable for a given security
- μ_{α} = Arithmetic mean of the winsorized variable, excluding any missing values
- σ_{α} = Standard deviation of the winsorized variable

Outlier Handling and Winsorization. Outlier z-scores are winsorized to ensure that the overall rate sensitivity scores are less distorted by extreme values. To do this, for a given z-score, the values for all securities are first ranked in ascending order. Then, for securities that lie above 4 or below -4, their value is set as equal to 4 or -4, whichever is applicable.

Rate Sensitivity Score Computation. Using the winsorized z-scores, a rate sensitivity score is computed for each of the securities. For a given security, if its winsorized z-score is above 0, then its rate sensitivity score will be the addition of 1 and the z-score. On the other hand, if its winsorized z-score is below 0, then its rate sensitivity score will be the result of the reciprocal of 1 subtracted by its z-score. For the negative rate sensitivity score multiply the z-score by minus one.

If $Z > 0$, Rate Sensitivity Score = $1 + Z$

If $Z < 0$, Rate Sensitivity Score = $(1 / (1 - Z))$

If $Z = 0$, Rate Sensitivity Score = 1

Appendix C

Methodology Changes

Methodology changes since December 4, 2017 are as follows:

Change	Effective Date (After Close)	Previous	Methodology Updated
Index Name	04/29/2019	The index name is S&P 500 Rising Rates Index.	The index name is S&P 500 High Rate Sensitivity Index.
Rate sensitivity score used for stocks with less than 36 months of trading history	04/19/2019	For securities with less than 36 months of trading history, regression is not performed. Instead, these securities are assigned a rate sensitivity score of 1, equal to the mean sensitivity of the universe to interest rates.	For securities with less than 36 months of trading history, regression is not performed. Instead, these securities are assigned a rate sensitivity score, equal to the mean sensitivity to interest rates of the corresponding sector in the universe.

Disclaimer

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