

**S&P Dow Jones
Indices**

A Division of **S&P Global**

S&P Risk Premia Rates Indices *Methodology*

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Table of Contents

Introduction	3
Index Objective and Highlights	3
Index Family	3
Supporting Documents	3
Index Construction	5
S&P Risk Premia Rates Carry Index	5
S&P Risk Premia Rates Value (Spread Reversion) Index	5
S&P Risk Premia Rates Momentum (Cross-Sectional) Index	6
Excess Return Indices Calculations	6
Total Return Indices Calculations	7
Data Source	7
Index Calculations	7
Index Maintenance	8
Rebalancing	8
Base Dates and History Availability	8
Index Governance	9
Index Committee	9
Index Policy	10
Holiday Schedule	10
Rebalancing	10
Unexpected Exchange Closures	10
Recalculation Policy	10
Contact Information	10
Index Dissemination	11
Tickers	11
Index Data	11
Web site	11
Appendix A	12
Methodology Changes	12
Disclaimer	13
Performance Disclosure/Back-Tested Data	13
Intellectual Property Notices/Disclaimer	14

Introduction

Index Objective and Highlights

The S&P Risk Premia Rates Indices are weighted return indices that measure the performance of long-short risk premia strategies in seven major global 10-year government bond futures contracts. The markets include the U.S., Canada, UK, Germany, Japan, Australia, and France. The performance of each bond futures contract represents the performance of a quarterly rolling position in the front month futures contract, measured by each index in the S&P Global Bond Futures Index Series. All indices maintain long allocations in three futures contracts with the highest values and short allocations in three futures contracts with the lowest values.

For information on the S&P Global Bond Futures Index Series, please refer to the S&P Global Bond Futures Index Series Methodology at www.spglobal.com/spdji/.

Index Family

The S&P Risk Premia Rates Indices currently include:

- **S&P Risk Premia Rates Carry Index.** The index measures the performance of a long-short carry strategy in major global government bond futures. Bond futures carry is measured by the yield spread between the 10-year yield and a short-term interest rate. The carry strategy maintains long allocations in the three futures contracts with the highest carry and short allocations in the three futures contracts with the lowest carry.
- **S&P Risk Premia Rates Value (Spread Reversion) Index.** The index measures the performance of a long-short value strategy in major global government bond futures. The value of bond futures is measured by the z-score of the Yield Spread between the 10-year yield and a short-term interest rate with respect to its one-year history. The value strategy maintains long allocations in the three futures contracts with the highest z-scores and short allocations in the three futures contracts with the lowest z-scores.
- **S&P Risk Premia Rates Momentum (Cross-Sectional) Index.** The index measures the performance of a long-short momentum strategy in major global government bond futures. Momentum is measured by the 12-month excess return index value change in local currency, excluding the most recent month. The momentum strategy maintains long allocations in the three futures contracts with the highest momentum and short allocations in the three futures with the lowest momentum.

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' Index Mathematics Methodology	Index Mathematics Methodology
S&P Dow Jones Indices' Commodities Indices Policies & Practices Methodology	Commodities Indices Policies & Practices 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.

Index Construction

A long position in a bond futures contract is a measure of the performance of a long position in the underlying benchmark bond, earning an equivalent yield reduced by the funding rate required to fund the long position and adjusted by the cheapest to deliver option on the benchmark bond held by the counterparty. For simplicity we calculate the Yield Spread between 10-year government bond yield and a short-term interest rate to approximate the yield that government bond futures carry.

Calculate the *Yield Spread_i* for country *i* in the universe of 10-year government bond futures:

$$Yield\ Spread_i = 10\text{-year on-the-run government bond yield}_i - 3\text{-month interest rate}$$

Component Index	Underlying Futures Contract	Symbol	Exchange	Interest Rate
S&P 10-Year U.S. Treasury Note Futures	10-Year U.S. Treasury Note Futures	TY	CME	3M US Treasury Rate
S&P 10-Year Canada Government Bond Futures Index	10-Year CGB Futures	CGB	MX	3M Canada Treasury Rate
S&P Long Gilt Futures Index	Long Gilt Futures	FLG	ICE	3M UK Treasury Rate
S&P Euro-Bund Futures	Euro-Bund Futures	FGBL	EUREX	3M German Treasury Rate
S&P 10-Year JGB Futures	10-Year JGB Futures	JGB	JPX	3M Japan Treasury Rate
S&P/ASX Australian 10-Year Treasury Bond Futures	10-Year Australian Treasury Bond Futures	XT	ASX	Australian Dollar 3 Month Bank Bill
S&P Euro-OAT Futures	Euro-OAT Futures	FOAT	EUREX	3M France Treasury Rate

S&P Risk Premia Rates Carry Index

Weight $W_{i,rb}$ for the designated futures contract of country *i* effective after the close of the rebalancing date *rb* is calculated with the following steps:

1. Rank all the countries in the universe in ascending order by *Yield Spread_{i,rf}* as of the rebalancing reference dates *rf*
2. $W_{i,rb} = -1/3$ if rank of *Yield Spread_{i,rf}* ≤ 3
 $= +1/3$ if rank of *Yield Spread_{i,rf}* ≥ 5 ¹

S&P Risk Premia Rates Value (Spread Reversion) Index

Weight $W_{i,rb}$ for the designated futures contract of country *i* effective after the close of the rebalancing date *rb* is calculated with the following steps:

1. Calculate the z-score of *Yield Spread* as of the rebalancing reference dates *rf* as follows:

$$Z_{i,rf} = \frac{Yield\ Spread_{i,rf} - \mu_{i,rf}}{\sigma_{i,rf}}$$

where:

¹ The S&P Euro-OAT Futures Index has a first value date of 04/30/2012. For rebalancings prior to 05/31/2012, only six underlying indices were included in the backtest, and $W_{i,rb} = +1/3$ if rank ≥ 4 .

$\mu_{i,rf}$ = Arithmetic mean of the winsorized daily *Yield Spread* variable over the past 12 months as of *rf*

$\sigma_{i,rf}$ = Standard deviation of the winsorized daily *Yield Spread* variable over the past 12 months as of *rf*

Winsorization reduces the impact of outliers on a data set by limiting them to a designated value. Both $\mu_{i,rf}$ and $\sigma_{i,rf}$ above are calculated with 95% winsorization, i.e, all data over the last 12 months below the 2.5% percentile is set to the 2.5% percentile and data over the last 12 months above the 97.5% percentile is set to the 97.5% percentile.

2. Rank all the countries in the universe in ascending order by $Z_{i,rf}$

3. $W_{i,rb} = -1/3$ if rank of $Z_{i,rf} \leq 3$

$= +1/3$ if rank of $Z_{i,rf} \geq 5^2$

S&P Risk Premia Rates Momentum (Cross-Sectional) Index

Weight $W_{i,rb}$ for the designated futures contract of country *i* effective after the close of the rebalancing date *rb* is calculated with the following steps:

1. $Momentum_{i,rf} = \left(\frac{ER_{i,prev_rf}}{ER_{i,prev_rf-12m}} \right) - 1$

where:

$ER_{i,prev_rf}$ = excess return index value of the respective bond futures index *i* in local currency as of the previous month reference date

$ER_{i,prev_rf-12m}$ = excess return index value of the respective bond futures index *i* in local currency as of 12 months prior to the previous month reference date

2. Rank all the countries in the universe in ascending order by $Momentum_{i,rf}$

3. $W_{i,rb} = -1/3$ if rank of $Momentum_{i,rf}$ is ≤ 3

$= +1/3$ if rank of $Momentum_{i,rf}$ is $\geq 5^3$

Excess Return Indices Calculations

On each business date *t*, the excess return index (USD) is calculated as:

$$ERIV_t = ERIV_{rb} * \sum_i W_{i,rb} * \left(\frac{ER_{i,t}}{ER_{i,rb}} - 1 \right) * \left(\frac{FX_{i,t}}{FX_{i,rb}} \right)$$

where:

$ERIV_t$ = Excess Return Index value as of the current date *t*

$ERIV_{rb}$ = Excess Return Index value as of the last rebalancing date *rb*

$W_{i,rb}$ = Weight of futures contract *i* effective from the last rebalancing date *rb*

$ER_{i,t}$ = excess return index value of the respective bond futures index *i* in local currency as of *t*

² The S&P Euro-OAT Futures Index's first value date is 04/30/2012. For rebalancings prior to 05/31/2013, only six underlying indices were included in the backtest, and $W_{i,rb} = +1/3$ if rank ≥ 4 .

³ The S&P Euro-OAT Futures Index's first value date is 04/30/2012. For rebalancings prior to 06/30/2013, only six underlying indices were included in the backtest, and $W_{i,rb} = +1/3$ if rank ≥ 4 .

$ER_{i,rb}$ = excess return index value of the respective bond futures index i in local currency as of the last rebalancing date rb

$FX_{i,t}$ = FX spot rate for the currency denomination of futures contract i as of t , in USD per currency

$FX_{i,rb}$ = FX spot rate for the currency denomination of futures contract i as of rb , in USD per currency

Both $ER_{i,t}$ and $ER_{i,rb}$ are the excess return index values from S&P Global Bond Futures Index Series

Total Return Indices Calculations

On any given calendar day, t , the Treasury Bill Return (TBR) is equal to an amount determined in accordance with the following formula:

$$TBR_t = \left[\frac{1}{1 - \frac{91}{360} * TB_{t-1}} \right]^{\frac{1}{91}} - 1$$

where:

TB_{t-1} = The 3 month T-Bill Rate available on the business day prior to day t .

A total return (USD) version of each index is calculated, which includes interest accrual based on 3 month T-Bill rate, as follows:

$$TRIV_t = TRIV_{t-1} * (1 + EReturn_t + TBR_t) * (1 + TBR_t)^{days}$$

where:

$TRIV_t$ = Total return index value as of the current date, t .

$TRIV_{t-1}$ = Total return index value as of immediately preceding CME Business Day $t-1$.

$EReturn_t$ = Excess Return on date t from the immediately preceding CME Business Day $t-1$

$$= \frac{ERIV_t}{ERIV_{t-1}} - 1$$

TBR_t = the Treasury Bill Return on date t

days = Number of non CME business days since the prior CME Business Day $t-1$

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

Data Source

On-the-run 10-year government bond yield rates are from LSEG. The source data for FX spot rates is WMR London 4:00 PM fixing rates.

WMR foreign exchange rates are taken daily at 4:00 PM London Time and used in the calculation of the indices. These mid-market fixings are calculated by WMR based on LSEG data and appear on LSEG pages.

Index Calculations

The indices calculate in U.S. dollars.

Index Maintenance

Rebalancing

The indices rebalance on month-end dates when all of the relevant futures markets are open for official trading. If any one of the relevant futures markets is not open, the indices rebalance on the immediately preceding day when all of the relevant futures markets are open for official trading.

The rebalancing reference date is one business day, as determined by the CME holiday calendar, prior to the rebalancing date. All data required to rebalance the indices are obtained as of the rebalancing reference date. If any data on rebalancing reference date is not available, the latest data available prior to the rebalancing reference date is used.

All days reflect after the close.

Rebalancing Schedule	
Rebalancing Frequency	Monthly
Announcement Date	T-1
Rebalancing Reference Date	T-1

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 Risk Premia Rates Carry Index	02/10/2020	09/28/2001	09/28/2001	100
S&P Risk Premia Rates Value (Spread Reversion) Index	02/10/2020	09/28/2001	09/28/2001	100
S&P Risk Premia Rates Momentum (Cross-Sectional) Index	03/30/2020	02/28/2002	02/28/2002	100

Index Governance

Index Committee

An S&P Dow Jones Indices' Index Committee maintains the indices. The Index Committee meets regularly. At each meeting, the Index Committee reviews any significant market events. In addition, the Index Committee may revise index policy covering rules for timing of rebalancing 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

Holiday Schedule

The indices are calculated when CME is open. If any one of the relevant futures markets is not open, bond futures closing price for the previous day is used.

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 Unexpected Exchange Closures, please refer to S&P Dow Jones Indices' Commodity Indices Policies & Practices Methodology.

Recalculation Policy

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

Contact Information

For any 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.com/spdji/, 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	Ticker
S&P Risk Premia Rates Carry Index (USD)	Excess Return Total Return	SPRPCP SPRPCT
S&P Risk Premia Rates Value (Spread Reversion) Index (USD)	Excess Return Total Return	SPRPRVP SPRPRVT
S&P Risk Premia Rates Momentum (Cross-Sectional) Index	Excess Return Total Return	SPRPRMUP SPRPRMUT

Index Data

Daily index levels and data are 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 A

Methodology Changes

Methodology changes since February 10, 2020, are as follows:

Change	Effective Date (After Close)	Previous	Methodology Updated
Rates used for the calculation of rebalancing weights: 1. S&P 10-Year U.S. Treasury Note Futures 2. S&P 10-Year Canada Government Bond Futures Index 3. S&P Long Gilt Futures Index 4. S&P Euro-Bund Futures 5. S&P 10-Year JGB Futures 6. S&P Euro-OAT Futures	11/30/2021	1. US Dollar 3 Month ICE LIBOR 2. Canadian Dollar 3 Month Interest Rate Fixing CAD 3. UK Pound Sterling 3 Month ICE LIBOR 4. EURO 3 MONTH EURIBOR 5. Japanese Yen 3 Month ICE LIBOR 6. EURO 3 Month EURIBOR	1. 3M US Treasury Rate 2. 3M Canada Treasury Rate 3. 3M UK Treasury Rate 4. 3M German Treasury Rate 5. 3M Japan Treasury Rate 6. 3M France Treasury Rate

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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