S&P Dow Jones Indices

A Division of S&P Global

S&P PRISM Index

Methodology

March 2019

Table of Contents

Introduction

Index Objective and Highlights

The S&P PRISM Index is an index of indices designed to measure the performance of an inverse risk weighted basket of three component indices after accounting for technical and fundamental indicators. The three underlying component indices each represent a different asset class, as defined below:

Underlying Component Index	Asset Class Represented
S&P 500 ER (3M Libor) Index	Equities
S&P GSCI Excess Return Index	Commodities
S&P 10-Year U.S. Treasury Note Futures Excess Return Index	Fixed Income

Please refer to Index Construction for details on each index's allocation to equities, commodities, and fixed income.

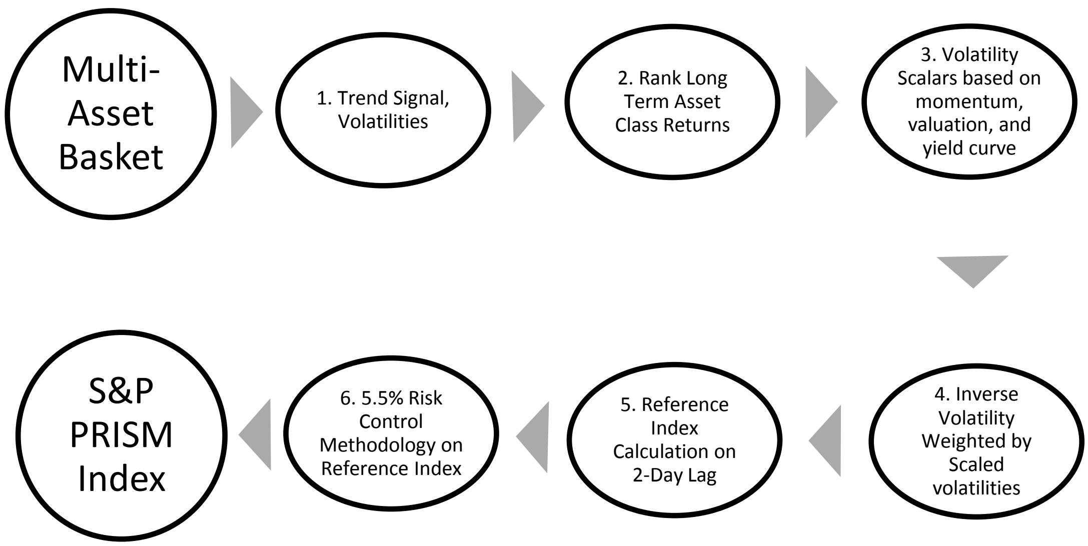
Supporting Documents

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
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
S&P Dow Jones Indices' Commodities Indices Policies & Practices Methodology	Commodities Indices Policies & Practices

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



Approach

The index allocates among three sub-indices based on their respective realized volatilities and a multiplier that is applied to its volatility. The resulting index of indices forms the underlying non-risk controlled index.

The underlying Commodity and Treasury futures sub-indices are calculated and published by S&P DJI on a daily basis as excess return indices.

The third underlying sub-index, the S&P 500 ER (3M Libor) Index, is calculated as follows and is based on the S&P 500 TR Index using the 3-month LIBOR for the interest rate:

S&P 500 ER (3M Libor) Index (SP500 ER3ML)

$$SP500\ ER3ML_t = SP500\ ER3ML_{t-1} * (1 + SP500\ 3ML_t\ Excess\ Return\ )$$

$$SP500\ 3ML_t\ \ Excess\ Return = \left(\frac{SP500\ TR\ Index_t}{SP500\ TR\ Index_{t-1}}\right) - \left(InterestRate_{t-1} * \frac{NumDays_t}{360}\right) - 1$$

Step 1: Trend Signals and Volatilities

Before calculating the weights in the non-risk controlled index, three trend signals are calculated. For each sub-index, the following process is used to calculate a binary "position indicator" series of 1 or 0:

A. Calculate the 200 day simple moving average of the underlying sub-indices.

$$200DMA_{asset,t} = \frac{\sum_{i=t}^{t-199} Index_{asset,i}}{200}$$

B. Calculate a trend signal based on the following rule:

$$Trend\ Signal_{asset,t} = \begin{cases} 1, & if\ Index_{asset,t} > 200DMA_{asset,t} \\ 0, & otherwise \end{cases}$$

C. Create two series, $UpCount_t$ and $DownCount_t$, that serve as counting indices. These indices will start at 0 on the 200th day, and increment each day thereafter.

$$UpCount_{asset,200} = DownCount_{asset,200} = 0$$

$$UpCount_{asset,t} = \begin{cases} UpCount_{asset,t-1} + 1, & if\ Trend\ Signal_{asset,t} = 1 \\ 0, & otherwise \end{cases}$$

$$DownCount_{asset,t} = \begin{cases} DownCount_{asset,t-1} + 1, & if\ Trend\ Signal_{asset,t} = 0 \\ 0, & otherwise \end{cases}$$

D. Finally, calculate the binary "position indicator" as follows:

$$Position\ Indicator_{asset,t} = \begin{cases} 1, & if\ UpCount_{asset,t} > 4 \\ 0, & if\ UpCount_{asset,t} \leq 4\ AND\ DownCount_{asset,t} > 4 \\ Position\ Indicator_{asset,t-1}, & otherwise \end{cases}$$

E. For each sub-index, compute the 90 day volatility of excess returns

$$Volatility_{asset,t} = \sqrt{\frac{\sum_{i=0}^{89} \left(DailyReturn_{asset,i} - AvgDailyReturn_{asset,t}\right)^2}{89}} * \sqrt{252}$$

Where,

$$DailyReturn_{asset,t} = \frac{Index_{asset,t}}{Index_{asset,t-1}} - 1$$

$$AvgDailyReturn_{asset,t} \frac{\sum_{i=0}^{89} \frac{Index_{asset,t-i-1}}{Index_{asset,t-i}} - 1}{90}$$

Step 2: Rank Long Sub-Index Returns

A. For each sub-index, compute the 200 day excess return

$$200\ Day\ Return_{asset,t} = \frac{Index_{asset,t}}{Index_{asset,t-200}} - 1$$

B. For each sub-index on an excess return basis, plus cash (which has a daily excess return of 0), rank the 200 day excess returns on day t across sub-index, with 1 being the highest return, and 4 being the lowest return.

C. Compute the trailing 5 day average rank for equities and fixed income.

Step 3: Volatility Scalars

A. Calculate a yield curve multiplier that is based on a lagged 120 day 60 day average of the spread between the 10-year U.S. Treasury rate and the 3-month U.S. Treasury rate as follows:

$$Yield\ Curve\ Multiplier_t = \begin{cases} 1, & if\ \dfrac{\sum_{i=1}^{60} 10\ Year\ Rate_{t-119-i} - 3\ Month\ Tbill\ Rate_{t-119-i}}{60} > 0 \\ 5, & Otherwise \end{cases}$$

B. Calculate a bond trend indicator:

$$Bond\ Trend\ Position_t = \begin{cases} 1, & if\ Position\ Indicator_{Bond,t} = 1 \\ 10, & if\ Position\ Indicator_{Bond,t} = 0\ AND\ (10\ Year\ Rate_t - 3\ Month\ Tbill\ Rate_t) < 0 \\ 1, & Otherwise \end{cases}$$

C. Calculate the earnings yield and reference 10-year yield as:

$$EY_t = Earnings\ Yield = \frac{1}{1\ yr\ forward\ PE_{t,s\&p500}}$$

$$10Y_t = 10 - Year\ Yield\ at\ time\ t$$

D. Calculate equity and bond volatility multipliers.

	Yield Curve Multiplier (3A)	Average Equity Rank (2B)	10Y vs EY (3C)	Position Indicator_t (1D)	Equity Mult_t (Result)
Scenario 1	1	4			5
Scenario 2	1	<> 4	10Y > EY		5
Scenario 3	1	<> 4	10Y <= EY	1	1
Scenario 4	1	<> 4	10Y <= EY	<> 1	5
Scenario 5	<> 1				Yield Curve Multiplier$_t$

	Avg Fixed Income Rank (2B)	20 Day 10Y MA (1A)	Bond Trend Position_t (3B)	Fixed Income Mult_t (Result)
Scenario 1	4			10
Scenario 2	<> 4	< 2%		10
Scenario 3	<> 4	>= 2%	1	1
Scenario 4	<> 4	>= 2%	<> 1	10

Step 4: Inverse Volatility Weighting

A. Calculate the scaled volatilities for both equities and fixed income as:

$$Equity\ Vol_t = Volatility_{Equity,t} * Equity\ Mult_t$$

$$Fixed\ Income\ Vol_t = Volatility_{Fixed\ Income,t} * Fixed\ Income\ Mult_t$$

B. Determine the inverse weights with regard to the target volatility

$$Inverse_{Equity,t} = \frac{5.5\%}{Equity\ Vol_t}$$

$$Inverse_{FI,t} = \frac{5.5\%}{Fixed\ Income\ Vol_t}$$

$$Inverse_{Comm,t} = \begin{cases} \frac{5.5\%}{Volatility_{Comm,t}}, if\ Rank_{Comm,t} = 1\ AND\ Position\ Indicator_{Comm,t} = 1 \\ 0\%,\ \ Otherwise \end{cases}$$

C. Calculate the final weights for each sub-index:

$$Final\ Weight_{asset,t} = \frac{Inverse_{asset,t}}{\sum_{asset} Inverse_{asset,t}}$$

Step 5: Reference Index Calculation

A. Calculate the index return:

$$Weighted\ Avg\ Return_t = \sum Final\ Weight_{asset,t-2} * Excess\ Daily\ Return_{asset,t}$$

$$Ref\ Index\ Return_t = \begin{cases} .75 * Weighted\ Avg\ Return_t\ , if\ Equity\ Mult_{t-2} + Fixed\ Income\ Mult_{t-2} = 15 \\ Weighted\ Avg\ Return_t\ , \quad Otherwise \end{cases}$$

B. Final step is to calculate the reference index level

$$Ref\ Index\ Level_t = Ref\ Index\ Level_{t-1} * (1 + Ref\ Index\ Return_t)$$

Step 6: Final Index Level

In order to calculate the final index levels, a risk control methodology is applied. Please refer to the Risk Control Indices section of the index mathematics document for equations 55, 56, 59 and 60, where the underlying index is the reference index calculated above and:

$$K_{rb} = Min(100\%, \frac{5.5\%}{Realized\ Volatility_{t-2}})$$

Index Maintenance

Rebalancing

The index is rebalanced on US business days after the market close. If a component of the index is not published on the rebalancing date, the prior value of that component is used. As part of the rebalancing process, the weights of the various asset class components are determined based on the sub-indices weights in the benchmarks as described in *Index Construction*.

Corporate Actions

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

Currency of Calculation and Additional Index Return Series

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 *S&P DJI's All Indices by Methodology Report*.

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

Base Date and History Availability

Index history availability, base date and base value are shown in the table below.

Index	Launch Date	First Value Date	Base Date	Base Value
S&P PRISM Index (USD)	02/12/2018	08/16/1990	08/16/1990	1000

Index Governance

Index Committee

S&P Dow Jones Indices’ Factor Indices Index Committee maintains the index. The Committee meets regularly. At each meeting, the Committee reviews matters that may affect index constituents, statistics comparing the composition of the index to the market, and any significant market events. In addition, the Index Committee may revise index policy covering rules for selecting constituents, 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

Holiday Schedule

The index is calculated on all U.S. equity market business days.

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.

Unexpected Exchange Closures

For information on Unexpected Exchange Closures, 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.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 *S&P DJI's All Indices by Methodology Report* for a complete list of indices covered by this document.

Index	Return Type	Bloomberg	Reuters
S&P PRISM Index (USD)	Excess Return	SPPRISME	.SPPRISME

Index Data

Daily constituent and index level data are 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.

Disclaimer

 This document does not constitute an offer of services in jurisdictions where S&P Dow Jones Indices LLC, S&P, Dow Jones or their respective affiliates (collectively "S&P Dow Jones Indices") do not have the necessary licenses. Except for certain custom index calculation services, all information provided by S&P Dow Jones Indices is impersonal and not tailored to the needs of any person, entity or group of persons. S&P Dow Jones Indices receives compensation in connection with licensing its indices to third parties and providing custom calculation services. Past performance of an index is not an indication or guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index may be available through investable instruments based on that index. S&P Dow Jones Indices does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. S&P Dow Jones Indices makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. S&P Dow Jones Indices LLC is not an investment advisor, and S&P Dow Jones Indices makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document. Prospective investors are advised to make an investment in any such fund or other vehicle only after carefully considering the risks associated with investing in such funds, as detailed in an offering memorandum or similar document that is prepared by or on behalf of the issuer of the investment fund or other investment product or vehicle. S&P Dow Jones Indices LLC is not a tax advisor. A tax advisor should be consulted to evaluate the impact of any tax-exempt securities on portfolios and the tax consequences of making any particular investment decision. Inclusion of a security within an index is not a recommendation by S&P Dow Jones Indices to buy, sell, or hold such security, nor is it considered to be investment advice.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, research, valuations, model, software or other application or output therefrom) or any part thereof ("Content") may be modified, reverse-engineered, reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of S&P Dow Jones Indices. The Content shall not be used for any unlawful or unauthorized purposes. S&P Dow Jones Indices and its third-party data providers and licensors (collectively "S&P Dow Jones Indices Parties") do not guarantee the accuracy, completeness, timeliness or availability of the Content. S&P Dow Jones Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN "AS IS" BASIS. S&P DOW JONES INDICES PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall S&P Dow Jones Indices Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.

S&P Global keeps certain activities of its various divisions and business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain divisions and business units of S&P Global may have information that is not available to other business units. S&P Global has established policies and procedures to maintain the confidentiality of certain non-public information received in connection with each analytical process.

In addition, S&P Dow Jones Indices provides a wide range of services to, or relating to, many organizations, including issuers of securities, investment advisers, broker-dealers, investment banks, other financial institutions and financial intermediaries, and accordingly may receive fees or other economic benefits from those organizations, including organizations whose securities or services they may recommend, rate, include in model portfolios, evaluate or otherwise address.