

S&P Risk Control 2.0 Indices *Methodology*

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Introduction

Index Objective

S&P Dow Jones Indices' Risk Control Indices measure the return of a strategy that applies dynamic exposure to an underlying index in an attempt to control the level of volatility. The S&P Risk Control 2.0 Indices are an alternative version of Risk Control indices, where the cash portion of the investment in the standard risk control strategy is replaced with a liquid bond index.

S&P Risk Control 2.0 Indices are based on the S&P 500, S&P 500 Sector Rotator Indices, S&P BRIC 40 Indices, S&P New China Sectors Index, S&P Kensho New Economies Sector Rotator, S&P Kensho Liquid Future Communication Index, and S&P 500 Futures 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' Fixed Income Policies & Practices Methodology	Fixed Income Policies & Practices
S&P Dow Jones Indices' Fixed Income 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 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

Approaches

S&P Risk Control 2.0 Indices are an extension of standard S&P Risk Control indices. The index consists of two assets, the index for a risky asset with its weight, and the corresponding bond index and its weight. Weights range between 0 and 100%, and no shorting or leveraging is allowed in the strategy.

The table below details each S&P Risk Control 2.0 index and the corresponding bond index:

Index Family	Corresponding Bond Index
S&P 500 Daily RC 2 Indices (USD)	S&P 10-Year U.S. Treasury Note Futures Total Return Index
S&P 500 Daily RC 2 Indices (EUR)	S&P Euro-Bund Total Return Index
S&P BRIC 40 Daily RC 2 Indices	S&P 10-Year U.S. Treasury Note Futures Total Return Index
S&P BRIC 40 Daily RC 2 Indices (EUR)	S&P Euro-Bund Total Return Index
S&P 500 Sector Rotator Daily RC 2 Indices	S&P 10-Year U.S. Treasury Note Futures Total Return Index
S&P 500 Sector Rotator Daily RC 2 (5 Year Treasury) Indices	S&P 5-Year U.S. Treasury Note Futures Total Return Index
S&P 500 Factor Rotator Daily RC2 7% Index (USD)	S&P 2-Year U.S. Treasury Note Futures Total Return Index
S&P New China Sectors Daily RC2 5% Excess Return (USD) Index	S&P 10-Year U.S. Treasury Note Futures Excess Return Index
S&P Kensho New Economies Sector Rotator Daily RC2 5% Index	S&P 5-Year U.S. Treasury Note Futures Total Return Index
S&P Kensho New Economies Sector Rotator Daily RC2 7% Index	S&P 5-Year U.S. Treasury Note Futures Total Return Index
S&P Kensho Liquid Future Communication Daily RC2 5% Index	S&P 5-Year U.S. Treasury Note Futures Total Return Index
S&P Kensho Liquid Future Communication Daily RC2 8% Index	S&P 5-Year U.S. Treasury Note Futures Total Return Index
S&P Kensho Liquid Future Communication Daily RC2 10% Index	S&P 5-Year U.S. Treasury Note Futures Total Return Index
S&P 500 Futures Daily Risk Control 5% Index	S&P 10-Year U.S. Treasury Note Futures Excess Return Index

The S&P 500 Daily RC 2 Indices consist of the S&P 500 and a liquid bond index. The indices are dynamically adjusted to target a specified level of volatility. Volatility is calculated as a function of historical returns that uses exponential weightings to give more significance to recent observations. In addition, short and long-term measures of volatility are used to cause the indices to deleverage quickly, but increase exposure more gradually on a relative basis. The underlying index for the S&P 500 Daily RC 2 Indices is the S&P 500 Total Return Index.

The S&P BRIC 40 Daily RC 2 Indices consist of the S&P BRIC 40 and a liquid bond index. The indices are dynamically adjusted to target a specified level of volatility. Realized historical volatility is calculated using an exponentially weighted average. Short and long-term measures of volatility are taken using decay factors of 94% and 97%, respectively. In order to be conservative, the higher level of volatility is used in the risk control calculation. The underlying index for the S&P BRIC 40 Daily RC 2 Indices is the S&P BRIC 40 Net Total Return Index.

The S&P 500 Sector Rotator Daily RC 2 Indices consist of the S&P 500 High Momentum Value Sector Rotation Index and a liquid bond index.

The S&P New China Sectors Daily RC2 5% Excess Return (USD) Index consists of the excess return of S&P New China Sectors Index and a liquid bond index. The excess return of S&P New China Sectors Index is calculated based on the S&P New China Sectors Index (USD) NTR less rolling 3-month USD Libor. Realized historical volatility is calculated using an exponentially weighted average.

For information on how to calculate the underlying indices, please refer to their individual index methodologies, located on our Web site at www.spdji.com.

The S&P 500 Futures Daily Risk Control 5% Index consists of the S&P 500 Futures Excess Return Index and the S&P 10-Year U.S. Treasury Note Futures Excess Return Index. The index follows the Risk Control 2.0 Indices with Minimum Variance methodology. When there is no feasible solution to the quadratic equation, the index defaults to the minimum variance weights instead of defaulting to the underlying equity index and cash defined in the first generation of Risk Control indices. As a result, the index will have an annualized volatility above the target, therefore, a scalar factor θ equal to the ratio of the volatility target and the index volatility is multiplied to the index weights. This will result in a cash allocation to get the 100% total allocation. In addition, the strategy has a daily limit allocation change of 15% for the equity and fixed income components.

For more information on the calculation of Risk Control 2.0 Indices with Minimum Variance, please refer to the S&P Index Mathematics Methodology.

For more information on the daily limit allocation change for equity and fixed income components, please refer to the Capped Equity Weight Change in the S&P Index Mathematics Methodology.

Currency of Calculation and Additional Index Return Series

The indices calculate in U.S. dollars and euros.

In addition to the indices detailed in this methodology, additional return series versions of the indices may be available. 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.

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.spdji.com.

Parameters

The parameters used for the S&P Risk Control 2.0 Indices follow the same calculation process as those in the standard Risk Control methodology. All indices have a maximum leverage of 100% and are exponentially weighted, except for the S&P 500 Factor Rotator Daily RC2 7% that has a maximum leverage of 150%. A three-day lag to rebalancing date is used for the S&P 500 Daily RC 2, S&P 500 Factor Rotator Daily RC2 7% and S&P BRIC 40 Daily RC 2 Indices. A two-day lag to rebalancing date is used for the S&P 500 Sector Rotator Daily RC 2 Indices, S&P Kensho New Economies Sector Rotator Daily RC2 Indices, S&P Kensho Liquid Future Communication Daily RC2 indices, S&P New China Sectors Daily RC2 5% Excess Return (USD) Index, and S&P 500 Advanced Daily RC2 5% Futures Index. Indices are rebalanced daily. The table below details the parameters for the indices:

Index	Risk Control Level	Interest Rate	Return Frequency for Volatility	Decay Factor Short-Term Volatility	Decay Factor Long-Term Volatility
S&P 500 Daily RC 2 8% Index	8%	Rolling 2 & 3-month USD LIBOR or Rolling 1 & 3-month Euribor	Daily	94%	97%
S&P 500 Daily RC 2 10% Index	10%	Rolling 2 & 3-month USD LIBOR or Rolling 1 & 3-month Euribor	Daily	94%	97%
S&P 500 Daily RC 2 15% Index	15%	Rolling 2 & 3-month USD LIBOR or Rolling 1 & 3-month Euribor	Daily	94%	97%
S&P BRIC 40 Daily RC 2 8% Index	8%	Rolling 3-month LIBOR or Euribor	Five days	94%	97%
S&P BRIC 40 Daily RC 2 10% Index	10%	Rolling 3-month LIBOR or Euribor	Five days	94%	97%
S&P BRIC 40 Daily RC 2 15% Index	15%	Rolling 3-month LIBOR or Euribor	Five days	94%	97%
S&P 500 Sector Rotator Daily RC 2 5% Index	5%	3-month LIBOR	Daily	94%	97%
S&P 500 Sector Rotator Daily RC 2 6% Index	6%	3-month LIBOR	Daily	94%	97%
S&P 500 Sector Rotator Daily RC 2 5% (5 Yr Treasury Index)	5%	3-month LIBOR	Daily	94%	97%
S&P 500 Sector Rotator Daily RC 2 6% (5 Yr Treasury Index)	6%	3-month LIBOR	Daily	94%	97%
S&P 500 Sector Rotator Daily RC 2 8% (5 Yr Treasury Index)	8%	3-month LIBOR	Daily	94%	97%
S&P 500 Sector Rotator Daily RC 2 10% (5 Yr Treasury Index)	10%	3-month LIBOR	Daily	94%	97%
S&P 500 Factor Rotator Daily RC2 7% (2 Yr Treasury Index)	7%	Effective Fed Funds Rate	Daily	94%	97%
S&P New China Sectors Daily RC2 5% Excess Return (USD) Index	5%	0%	Five days	98.6%	98.6%
S&P Kensho New Economies Sector Rotator Daily RC2 5% Index	5%	2-month LIBOR & 3-month LIBOR	Daily	94%	97%
S&P Kensho New Economies Sector Rotator Daily RC2 7% Index	7%	2-month LIBOR & 3-month LIBOR	Daily	94%	97%
S&P Kensho Liquid Future Communication Daily RC2 5% Index	5%	2-month LIBOR & 3-month LIBOR	Daily	94%	97%
S&P Kensho Liquid Future Communication Daily RC2 8% Index	8%	2-month LIBOR & 3-month LIBOR	Daily	94%	97%
S&P Kensho Liquid Future Communication Daily RC2 10% Index	10%	2-month LIBOR & 3-month LIBOR	Daily	94%	97%
S&P 500 Futures Daily Risk Control 5% Index	5%	Overnight USD LIBOR	Daily	94%	97%

Decimal Places Used in Calculations

Indices using the S&P 500 as an underlying index are rounded to two decimal places for the entire history from August 3, 1998 to current. Indices using the S&P BRIC 40 as an underlying index are not rounded for history until January 19, 1999. From January 20, 1999 through September 7, 1999, the values are rounded to two decimal places. From September 8, 1999 to October 5, 1999, the values are rounded to three decimal places. From October 6, 1999 to current, the indices are rounded to two decimal places.

For information on S&P Risk Control Indices, as well as the weighting calculations used in the S&P Risk Control 2.0 Indices, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.

Index Governance

Index Committee

Each of S&P Dow Jones Indices' indices is the responsibility of an Index Committee that monitors overall policy guidelines and methodologies, as well as additions to and deletions from these indices.

Decisions made by the Index Committee include all matters relating to index construction and maintenance. The Index Committee meets regularly to review market developments and convenes as needed to address major corporate actions.

It is the sole responsibility of the Index Committee to decide on all matters relating to methodology, maintenance, constituent selection and index procedures. The Index Committee makes decisions based on all publicly available information and discussions are kept confidential to avoid any unnecessary impact on market trading.

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

Announcements of the daily index values are made before the open of the next trading day.

Holiday Schedule

An S&P Risk Control 2.0 Index will not rebalance on days when 15% or more of the constituents in the underlying risk index are closed. For more information, please refer to the S&P Dow Jones Indices Index Mathematics' Methodology.

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

Unexpected Exchange Closures

For information on Unexpected Exchange Closures, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

For information on Calculations and Pricing Disruptions, Expert Judgment, Data Hierarchy, Unexpected Exchange Closures and Error Corrections, 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 and Fixed Income Policies & Practices Methodology documents for the underlying equity index and bond index, respectively.

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 and S&P Dow Jones Indices' Fixed Income Policies & Practices Methodology documents for the underlying equity index and bond index, respectively.

Contact Information

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

Index Dissemination

Historical index returns are available through S&P Dow Jones Indices' index data group via subscription.

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 (Currency)	Return Type	Ticker
S&P 500 Daily RC 2 8% Index (USD)	Total Return	SPX8UN2
S&P 500 Daily RC 2 8% Index (EUR)	Total Return	SPX8EN2
S&P 500 Daily RC 2 8% Index (USD)	Excess Return	SPX8UE2
S&P 500 Daily RC 2 8% Index (EUR)	Excess Return	SPX8EE2
S&P 500 Daily RC 2 10% Index (USD)	Total Return	SPX10UN2
S&P 500 Daily RC 2 10% Index (EUR)	Total Return	SPX10EN2
S&P 500 Daily RC 2 10% Index (USD)	Excess Return	SPX10UE2
S&P 500 Daily RC 2 10% Index (EUR)	Excess Return	SPX10EE2
S&P 500 Daily RC 2 15% Index (USD)	Total Return	SPX15UN2
S&P 500 Daily RC 2 15% Index (EUR)	Total Return	SPX15EN2
S&P 500 Daily RC 2 15% Index (USD)	Excess Return	SPX15UE2
S&P 500 Daily RC 2 15% Index (EUR)	Excess Return	SPX15EE2
S&P BRIC 40 Daily RC 2 8% Index (USD)	Net Total Return	SPB8UN2
S&P BRIC 40 Daily RC 2 8% Index (EUR)	Net Total Return	SPB8EN2
S&P BRIC 40 Daily RC 2 8% Index (USD)	Excess Return	SPB8UE2
S&P BRIC 40 Daily RC 2 8% Index (EUR)	Excess Return	SPB8EE2
S&P BRIC 40 Daily RC 2 10% Index (USD)	Net Total Return	SPB10UN2
S&P BRIC 40 Daily RC 2 10% Index (EUR)	Net Total Return	SPB10EN2
S&P BRIC 40 Daily RC 2 10% Index (USD)	Excess Return	SPB10UE2
S&P BRIC 40 Daily RC 2 10% Index (EUR)	Excess Return	SPB10EE2
S&P BRIC 40 Daily RC 2 15% Index (USD)	Net Total Return	SPB15UN2
S&P BRIC 40 Daily RC 2 15% Index (EUR)	Net Total Return	SPB15EN2
S&P BRIC 40 Daily RC 2 15% Index (USD)	Excess Return	SPB15UE2
S&P BRIC 40 Daily RC 2 15% Index (EUR)	Excess Return	SPB15EE2
S&P 500 Sector Rotator Daily RC2 5% (5Yr Treasury) Index (EUR)	Excess Return	SPXSRF5E
S&P 500 Sector Rotator Daily RC2 5% (5Yr Treasury) Index (USD)	Total Return	SPXSRF5T
S&P 500 Sector Rotator Daily RC2 6% (5Yr Treasury) Index (EUR)	Excess Return	SPXSRF6E
S&P 500 Sector Rotator Daily RC2 6% (5Yr Treasury) Index (USD)	Total Return	SPXSRF6T
S&P 500 Sector Rotator Daily RC2 5% Index (EUR)	Excess Return	SPXSRT5E
S&P 500 Sector Rotator Daily RC2 5% Index (USD)	Total Return	SPXSRT5T
S&P 500 Sector Rotator Daily RC2 6% Index (EUR)	Excess Return	SPXSRT6E
S&P 500 Sector Rotator Daily RC2 6% Index (USD)	Total Return	SPXSRT6T
S&P 500 Factor Rotator Daily RC2 7% Index (USD)	Total Return	SPXFRRT7
S&P 500 Factor Rotator Daily RC2 7% Index (USD)	Excess Return	SPXFRRE7
S&P New China Sectors Daily RC2 5% Excess Return (USD) Index	Excess Return	SPCS5UE2
S&P Kensho New Economies Sector Rotator Daily RC2 5% Index (USD)	Total Return	KNESRT5
	Excess Return	KNESRE5
S&P Kensho New Economies Sector Rotator Daily RC2 7% Index (USD)	Total Return	KNESRT7
	Excess Return	KNESRE7
S&P Kensho Liquid Future Communication Daily RC2 5% Index (USD)	Total Return	KCNLQT5
	Excess Return	KCNLQE5
S&P Kensho Liquid Future Communication Daily RC2 8% Index (USD)	Total Return	KCNLQT8
	Excess Return	KCNLQE8

Index (Currency)	Return Type	Ticker
S&P Kensho Liquid Future Communication Daily RC2 10% Index (USD)	Total Return	KCNLQT10
	Excess Return	KCNLQE10
S&P 500 Futures Daily Risk Control 5% Index	Total Return	SPXFR5UT
	Excess Return	SPXFR5UE

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.

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