S&P Dow Jones Indices

A Division of S&P Global

S&P Economic Cycle Factor Rotator Indices
Methodology

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Introduction

Index Objective and Highlights

The S&P Economic Cycle Factor Rotator Indices ("Rotator Indices")[1] measure the weighted return performance of a rotational strategy across a series of sub-indices. The weight of each sub-index is determined by the designated economic indicator applicable to each underlying index's region. The S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index is comprised of the three regional rotator indices with static proportions and a target volatility of 4.5%.

Strategy Series

The Economic Cycle Factor Rotator strategies share the above objective. The strategies are:

- **Equity Only Strategies.** The equity only strategies are long only without additional risk control overlays.
- **Risk Control 2.0 Strategies (futures & cash bond).** The risk control 2.0 strategies use volatility-targeted sub-indices of equities and fixed income (either bond futures or cash bonds).
- **Long/Short Strategies.** The long/short strategies seek to be market neutral for a factor strategy when the short-term moving average of the S&P 500 is lower than the long-term moving average, and are allocated to a factor strategy when the short-term moving average is greater than or equal to the long-term moving average.
- **Beta-Neutral Strategies.** The beta-neutral strategies seek to be beta-neutral for a factor strategy by taking a long position in the targeted factor strategy and a short position in the S&P Japan 500 Total Return Index based on the past 126-day beta of the targeted factor strategy relative to the S&P Japan 500.

The sub-indices are daily risk control indices with a target volatility of 6%. Each daily risk-controlled sub-index consists of one component equity index and one component fixed income index.

Rotator Index	Strategy	Strategy Universe	Risk Control Sub-index	Economic Indicator
S&P Economic Cycle Factor Rotator Index ("U.S. Rotator Index")	Momentum	S&P United States LargeMidCap	S&P Momentum Daily Risk Control 6% Excess Return Index	The Chicago Fed National Activity Index ("CFNAI")
	Value	S&P 500	S&P Value Daily Risk Control 6% Excess Return Index	
	Buyback	S&P 500	S&P Buyback Daily Risk Control 6% Excess Return Index	
	Low Volatility High Dividend	S&P 500	S&P Low Volatility High Dividend Daily Risk Control 6% Excess Return Index	

[1] The Rotator Indices have variants using different types of equity components and fixed income components. For further details, please refer to *Eligibility Criteria* and *Index Construction* on the following pages.

Rotator Index	Strategy	Strategy Universe	Risk Control Sub-index	Economic Indicator
S&P Europe 350 Economic Cycle Factor Rotator Index ("European Rotator Index")[2]	Momentum	S&P Europe 350	S&P Europe 350 Momentum Daily Risk Control 6% Index (EUR) ER	OECD Four Big European Composite Leading Indicator ("CLI")
	Value		S&P Europe 350 Enhanced Value Daily Risk Control 6% Index (EUR) ER	
	Buyback		S&P Europe 350 Buyback Daily Risk Control 6% Index (EUR) ER	
	Low Volatility High Dividend		S&P Europe 350 Low Volatility High Dividend Daily Risk Control 6% Index (EUR) ER	
S&P Japan Economic Cycle Factor Rotator Index ("Japan Rotator Index")	Value	S&P Japan LargeMidCap	S&P Japan Value Daily Risk Control 6% Excess Return Index (PR)	Japan Tankan ("Tankan")[3] and ESRI Indexes of Business Conditions Coincident Diffusion Index ("ESRI")[4]
	Buyback	S&P Japan 500	S&P Japan Buyback Daily Risk Control 6% Excess Return Index (PR)	
	Low Volatility	S&P Japan 500	S&P Japan Low Volatility Daily Risk Control 6% Excess Return Index (PR)	

Economic Indicators

Chicago Fed National Activity Index ("CFNAI"). The CFNAI is a weighted average of 85 indicators of U.S. economic activity drawn from four broad data categories:

- Production and income
- Employment, unemployment, and hours
- Personal consumption and housing
- Sales, orders, and inventories

A zero value for the index indicates that the national economy is expanding at its historical trend rate of growth; negative values indicate below-average growth; and positive values indicate above-average growth.

CFNAI data, representing the previous month's activity, is typically released around the 21st of each month. Current CFNAI data is available at the Federal Reserve Bank of Chicago's Web site at www.chicagofed.org/research/data/cfnai/current-data. The new monthly signal is announced three business days prior to the month end, and is implemented on the close of the first business day of the following month.

OECD Four Big European Composite Leading Indicator ("CLI"). The composite leading indicator (CLI) is designed to provide early signals of turning points in business cycles showing fluctuation of the economic activity around its long-term potential level. The OECD aims for the turning points of the CLI to consistently precede those of the business cycle, typically by six to nine months (lead time varies).

CLIs show short-term economic movements in qualitative rather than quantitative terms. The long-term average of the amplitude adjusted CLI is 100 which represents the trend of economic activity.

The OECD CLIs are compiled and published on a monthly basis. The input data for a given month "t" is available in month "t+2" and is available at the OECD Data website at https://stats.oecd.org/Index.aspx?datasetcode=MEI_CLI#. The latest 10 months of available indicator levels are used to determine a monthly signal which is announced three business days prior to month end and is implemented on the close of the first business day of the following month.

[2] The European Rotator Index is also available on a non-excess return basis using component equity indices based on their price returns.

[3] Japan Tankan Business Conditions All Enterprises All Industries (NSA. % Balance/Diffusion Index). For the comprehensive data set, please refer to: http://www.boj.or.jp/en/statistics/tk/zenyo/2016/index.htm/.

[4] ESRI website: https://www.e-stat.go.jp/en/stat-search/files?page=1&query=preliminary%20release&layout=dataset&toukei=00100406&tstat=000001011734.

Tankan: The Short-Term Economic Survey of Enterprises in Japan ("Tankan"). Tankan is the Japanese abbreviation for Tanki Keizai Kansoku Chousa, the Short-Term Economic Survey of Enterprises in Japan. Tankan is a statistical survey carried out by the Bank of Japan with the aim of providing an accurate picture of the business trends of enterprises in Japan. The survey is conducted on a quarterly basis, covering approximately 10,000 enterprises.

The Tankan grasps overall corporate activity by combining a judgment survey, which covers the responding enterprises' views on the current state of and outlook for such items as their business conditions and economic developments, and a quantitative survey, which covers the actual results and forecasts for the responding enterprises' business plans, including figures for sales, profits, and fixed investment. The Tankan summary includes a variety of statistics. The Japan Tankan Business Conditions All Enterprises All Industries (NSA, % Balance/Diffusion Index) is used as an economic indicator for the Japan Rotator Index to make quarterly factor allocations.

The Tankan summary is usually released quarterly on the first business day of April (March Survey), July (June Survey), October (September Survey), and the second Friday of December (December Survey).

ESRI Indexes of Business Conditions ("ESRI"). The Indexes of Business Conditions are summary measures for aggregate economic activity compiled by ESRI (Economic and Social Research Institute). These indexes combine the behavior of key cyclical indicators that represent widely differing activities of the economy such as production, employment, and others. While the composite indexes are used to reflect the volume of overall business activities by composing percentage changes of selected indicators, diffusion indexes can serve as a useful tool to determine turning points of the business cycle, among other purposes, by counting changes in directions of selected indicators.

The ESRI Indexes of Business Conditions Coincident Diffusion Index serves as a supplementary economic indicator for the Japan Rotator Index to make monthly factor allocation adjustments relative to the quarterly factor allocation determined by the Tankan signal.

The ESRI Indexes of Business Conditions are compiled and published on a monthly basis. The input data for a given month "t" is available in month "t+2" and is available at the ESRI website. The preliminary release of ESRI Indexes of Business Conditions is usually made around the seventh calendar day of each month.

Please refer to Index Construction for details on each sub-index's allocation to equity and fixed income, and the rule according to which the Rotator Index allocates among the four sub-indices based on current and historical economic indicator data.

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 Index 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.

Eligibility Criteria

Index Eligibility

The eligible component indices used to represent the sub-indices are detailed in the tables below.

S&P Economic Cycle Factor Rotator Index ("U.S. Rotator Index") Sub-Indices and Sub-Components

Sub-index	Asset Class	Sub-Components		Ticker
S&P Momentum Daily Risk Control 6% Excess Return Index	Equity	S&P Momentum United States LargeMidCap (USD) Excess Return[5]		SPUSMUE
	Fixed Income	Bond Future	S&P 5-Year U.S. Treasury Note Futures Excess Return Index	SPUST5P
		Cash Bond[6]	S&P U.S. Treasury Bond 5-7 Year Excess Return Index	--
	Cash[7]	SOFR Overnight + 0.13088%		SOFRS3M=

Sub-index	Asset Class	Sub-Components		Ticker
S&P Value Daily Risk Control 6% Excess Return Index	Equity	S&P 500 Pure Value Excess Return[5]		500PVER
	Fixed Income	Bond Future	S&P 5-Year U.S. Treasury Note Futures Excess Return Index	SPUST5P
		Cash Bond[6]	S&P U.S. Treasury Bond 5-7 Year Excess Return Index	--
	Cash[7]	SOFR Overnight + 0.13088%		SOFRS3M=

Sub-index	Asset Class	Sub-Components		Ticker
S&P Buyback Daily Risk Control 6% Excess Return Index	Equity	S&P 500 Buyback FCF Index Excess Return[5]		SPBUYFUER
	Fixed Income	Bond Future	S&P 5-Year U.S. Treasury Note Futures Excess Return Index	SPUST5P
		Cash Bond[6]	S&P U.S. Treasury Bond 5-7 Year Excess Return Index	--
	Cash[7]	SOFR Overnight + 0.13088%		SOFRS3M=

Sub-index	Asset Class	Sub-Components		Ticker
S&P Low Volatility High Dividend Daily Risk Control 6% Excess Return Index	Equity	S&P 500 Low Volatility High Dividend Excess Return[5]		SP5LVHDE
	Fixed Income	Bond Future	S&P 5-Year U.S. Treasury Note Futures Excess Return Index	SPUST5P
		Cash Bond[6]	S&P U.S. Treasury Bond 5-7 Year Excess Return Index	--
	Cash[7]	SOFR Overnight + 0.13088%		SOFRS3M=

For information on the component equity indices, please refer to the S&P Momentum Indices Methodology, S&P U.S. Style Indices Methodology, S&P Buyback FCF and PE Indices Methodology, and S&P Low Volatility High Dividend Indices Methodology, respectively.

In conjunction with these methodologies, please refer to S&P Dow Jones Indices' Index Mathematics Methodology for details on excess return index calculations. These documents are available at www.spglobal.com/spdji/.

[5] The U.S. Rotator Index is available in two excess return types; using component equity indices based on either their price returns or total returns.
[6] The Rotator Index and Cash Bond index use the Bond Futures Index and the Cash Bond Index as their respective fixed income components.
[7] Cash items are used in calculating the excess return; the indices do not hold cash.

S&P Europe 350 Economic Cycle Factor Rotator Index ("European Rotator Index")[8] Sub-Indices and Sub-Components

Sub-index	Asset Class	Sub-Components		Ticker
S&P Europe 350 Momentum Daily Risk Control 6% Index (EUR) ER	Equity	S&P Europe 350 Momentum Excess Return Index (EUR)		SP350MEPE
	Fixed Income	Bond Future	S&P Euro-Bund Futures Excess Return Index	SPEUBDP
	Cash[9]	1-Month EURIBOR interest rate		EU0001M
		3-Month EURIBOR interest rate		EU0003M

Sub-index	Asset Class	Sub-Components		Ticker
S&P Europe 350 Enhanced Value Daily Risk Control 6% Index (EUR) ER	Equity	S&P Europe 350 Enhanced Value Excess Return Index (EUR)		SPEEVEPE
	Fixed Income	Bond Future	S&P Euro-Bund Futures Excess Return Index	SPUST5P
	Cash[9]	1-Month EURIBOR interest rate		EU0001M
		3-Month EURIBOR interest rate		EU0003M

Sub-index	Asset Class	Sub-Components		Ticker
S&P Europe 350 Buyback Daily Risk Control 6% Index (EUR) ER	Equity	S&P Europe 350 Buyback Excess Return Index (EUR)		SPEBBEPE
	Fixed Income	Bond Future	S&P Euro-Bund Futures Excess Return Index	SPUST5P
	Cash[9]	1-Month EURIBOR interest rate		EU0001M
		3-Month EURIBOR interest rate		EU0003M

Sub-index	Asset Class	Sub-Components		Ticker
S&P Europe 350 Low Volatility High Dividend Daily Risk Control 6% Index (EUR) ER	Equity	S&P Europe 350 Low Volatility High Dividend Excess Return Index (EUR)		SPEULVDPE
	Fixed Income	Bond Future	S&P Euro-Bund Futures Excess Return Index	SPUST5P
	Cash[9]	1-Month EURIBOR interest rate		EU0001M
		3-Month EURIBOR interest rate		EU0003M

For information on the component equity indices, please refer to the S&P Momentum Indices Methodology, S&P Enhanced Value Indices Methodology, S&P Europe 350 Buyback Index Methodology, and S&P Low Volatility High Dividend Indices Methodology, respectively. In addition, please refer to S&P Dow Jones Indices' Index Mathematics Methodology for details on excess return index calculations. These documents are available at www.spglobal.com/spdji/.

[8] The European Rotator Index is also available on a non-excess return basis using component equity indices based on their price returns.
[9] Cash items are used in calculating the excess return; the indices do not hold cash.

S&P Japan Economic Cycle Factor Rotator Index ("Japan Rotator Index")[10] Sub-Indices and Sub-Components

Sub-index	Asset Class	Sub-Components		Ticker
S&P Japan Value Daily Risk Control 6% Excess Return Index (PR)	Equity	S&P Enhanced Value Japan LargeMidCap Excess Return Index (PR)		SEVJXJPE
	Fixed Income	Bond Future	S&P 10-Year JGB Futures Excess Return Index	SPJGBER
	Cash[11]	1-Month TIBOR interest rate		DIBJP1MD=
		3-Month TIBOR interest rate		DIBJP3MD=

Sub-index	Asset Class	Sub-Components		Ticker
S&P Japan Buyback Daily Risk Control 6% Excess Return Index (PR)	Equity	S&P Japan 500 Buyback FCF Excess Return Index (PR)		SPJBFJPE
	Fixed Income	Bond Future	S&P 10-Year JGB Futures Excess Return Index	SPJGBER
	Cash[11]	1-Month TIBOR interest rate		DIBJP1MD=
		3-Month TIBOR interest rate		DIBJP3MD=

Sub-index	Asset Class	Sub-Components		Ticker
S&P Japan Low Volatility Daily Risk Control 6% Excess Return Index (PR)	Equity	S&P Japan 500 Low Volatility Excess Return Index (PR)		SPJ5LVJPE
	Fixed Income	Bond Future	S&P 10-Year JGB Futures Excess Return Index	SPJGBER
	Cash[11]	1-Month TIBOR interest rate		DIBJP1MD=
		3-Month TIBOR interest rate		DIBJP3MD=

For information on the component equity indices, please refer to the S&P Enhanced Value Indices Methodology, S&P Buyback FCF and PE Indices Methodology, and S&P Low Volatility Indices Methodology, respectively. In addition to these methodologies, please refer to S&P Dow Jones Indices' Index Mathematics Methodology for details on excess return index calculations. These documents are available at www.spglobal.com/spdji/.

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

S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index

Sub-index	Sub-Components	Ticker
S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index	S&P Economic Cycle Factor Rotator Index	SPECFR6P
	S&P Europe 350 Economic Cycle Factor Rotator (USD) ER[12]	--
	S&P Japan Economic Cycle Factor Rotator Index (USD)[13]	--

[10] The Japan Rotator Index is only available in one excess return type; using component equity indices based on their price returns.
[11] Cash items are used in calculating the excess return; the indices do not hold cash.
[12] The S&P Europe 350 Economic Cycle Factor Rotator (USD) ER is the monthly principal hedged USD version of the S&P Europe 350 Economic Cycle Factor Rotator (EUR) ER. Please see Appendix II for the calculation of monthly principal hedged currency index levels.
[13] The S&P Japan Economic Cycle Factor Rotator Index (USD) is the monthly principal hedged USD version of the S&P Japan Economic Cycle Factor Rotator Index (JPY). Please see Appendix II for the calculation of monthly principal hedged currency index levels.

Index Construction

Approach

Target sub-indices are created as the basis for the S&P Economic Cycle Factor Rotator Indices. On a monthly basis, the U.S. Rotator Index, Europe Rotator Index, and Japan Rotator Index allocates to one of these target sub-indices depending on its corresponding economic indicator, based on the Target Style Allocation Scheme. The S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index allocates among the three regional economic rotator indices with static proportions and a target volatility of 4.5%.

Component Equity Indices for the "U.S. Rotator Index", "European Rotator Index", and "Japan Rotator Index"

Each sub-index includes a component equity index. Different versions of the component equity indices are calculated as follows:

S&P Economic Cycle Factor Rotator Index ("U.S. Rotator Index")

- Excess return on the underlying index's price return
- Excess return on the underlying index's total return

S&P Europe 350 Economic Cycle Factor Rotator Index ("European Rotator Index")

- Excess return on the underlying index's price return
- Underlying index's price return (reflecting no dividends or borrowing costs)

S&P Japan Economic Cycle Factor Rotator Index ("Japan Rotator Index")

- Excess return on the underlying index's price return

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

Sub-Indices

The first step in the formation of the Rotator Index is to determine and calculate the Sub-Indices. Please refer to *Appendix I* for more details on the Sub-Index.

Target Style Allocation Scheme for the "U.S. Rotator Index" and "European Rotator Index"

The next step in the formation of the Rotator Index is to determine to which Sub-Index to allocate. This is based on the three-month average and change of the corresponding economic indicator ("Indicator"). For each month, *k*, the three-month average and change of the indicator are defined as follows:

$$3M\ Average(k) = \frac{1}{3} * \{Indicator(k) + Indicator(k-1) + Indicator(k-2)\}$$

$$3M\ Change(k) = Indicator(k) - Indicator(k-3)$$

where:

Indicator(*k*) = The most recent value of the Indicator available as of month k

Indicator(*k-j*) = The Indicator value for the j^{th} month prior to the most recent available as of month k

If restated values are available for previous months, they will be used in the calculation of the current three-month average and three-month change. However, the index will not revise previously calculated averages and change rates from previous index rebalance events.

On the first trading day of each calendar month, the target style Equity Allocated Index (*k*) is determined as follows:

1. If 3M Average$(k-lag) \geq$ Center Line, 3M Change$(k-lag) \geq 0$, then Signal (k) is Momentum
2. If 3M Average$(k-lag) <$ Center Line, 3M Change$(k-lag) \geq 0$, then Signal (k) is Value
3. If 3M Average$(k-lag) \geq$ Center Line, 3M Change$(k-lag) < 0$, then Signal (k) is Buyback
4. If 3M Average$(k-lag) <$ Center Line, 3M Change$(k-lag) < 0$, then Signal (k) is Low Volatility High Dividend

where:

For the U.S. Rotator:

Center Line = 0 and Lag = 0

If Signal (*k*) = Low Volatility High Dividend and Signal (*k*-1) = Value, then Equity Allocated Index (*k*) = Value. Otherwise, Equity Allocated Index (*k*) = Signal (*k*).

For the European Rotator:

Center Line = 100 and Lag[14] = 6

If the set of signals $\{Signal\ (k+i) \mid i\ from\ 1\ to\ 6\}$ contains Equity Allocated Index (*k*-1)*, then Equity Allocated Index (*k*) = Equity Allocated Index (*k*-1). Otherwise, Equity Allocated Index (*k*) = Signal (*k*).

At each monthly rebalancing, an indicator vector, $\vec{v}_t$, is used to identify the target portfolio deployed at time *t* and is defined as follows:

For month *k*,

If Equity allocated index (*k*) is Momentum, then $\vec{v}_t = \{1,0,0,0\}$

If Equity allocated index (*k*) is Value, then $\vec{v}_t = \{0,1,0,0\}$

If Equity allocated index (*k*) is Buyback, then $\vec{v}_t = \{0,0,1,0\}$

If Equity allocated index (*k*) is Low Volatility High Dividend, then $\vec{v}_t = \{0,0,0,1\}$

Furthermore, ${\vec{v}_t}^i$ returns the i[th] value of the vector at time *t*. For example, if the style at time *t* is 3, then ${\vec{v}_t}^3 = 1$, and ${\vec{v}_t}^1 = {\vec{v}_t}^2 = {\vec{v}_t}^4 = 0$.

Target Style Allocation Scheme for the "Japan Rotator Index"

The allocation of the "Japan Rotator Index" is determined by two economic indicators in conjunction (the Tankan and ESRI Indexes of Business Conditions Coincident Diffusion Index), at the respective quarterly Tankan and monthly ESRI rebalancing dates. The Tankan rebalancing effective date is the third index business day after the quarter's calendar end. The ESRI rebalance date is on the 15th calendar day of every month, or the next immediately available index business day (to account for the ESRI publication calendar).

[14] Since the OECD Four Big European Composite Leading Indicator ("CLI") is a leading indicator and early signals of turning points typically precede the business cycle by six to nine months, then the target style allocation scheme employs a lag in the CLI data accordingly.

* Equity Allocated Index (k-1) equals the Equity Allocated Index calculated as of the previous rebalancing.

Every quarter, there are four rebalancings as described below:

Symbol	Rebalancing Date	Description	Example
$d_{Quarter}$	Quarterly Tankan rebalancing date	3rd index business day after previous calendar quarter end	Oct 3, 2018
d_{month1}	First monthly ESRI rebalancing date in the quarter	15th calendar day of first month in the current calendar quarter	Oct 15, 2018
d_{month2}	Second monthly ESRI rebalancing date in the quarter	15th calendar day of second month in the current calendar quarter	Nov 15, 2018
d_{month3}	Third monthly ESRI rebalancing date in the quarter	15th calendar day of third month in the current calendar quarter	Dec 15, 2018

On each quarterly Tankan rebalancing date ($d_{Quarter}$), determine the Tankan signal (a value of 1, 2, or 3) as follows:

- If the current Tankan level > 0 + trailing 3-Year standard deviation of quarterly Tankan level, then the Tankan signal is 1.
- If the current Tankan level < 0 – trailing 3-Year standard deviation of quarterly Tankan level, then the Tankan signal is 3.
- Else, the Tankan signal is 2.

On the first monthly ESRI rebalancing date of each quarter (d_{month1}), determine the ESRI signal (a value of -1, 0, or 1) as follows:

- If the three trailing monthly ESRI coincident diffusion readings are ALL above 80 (upturn in the business cycle), the ESRI signal is -1.
- If the three trailing monthly ESRI coincident diffusion readings are ALL below 20 (downturn in the business cycle), the ESRI signal is 1.
- Else, the ESRI signal is 0.

On the second and third monthly ESRI rebalancing dates of each quarter, determine the ESRI signal (a value of -1, 0, or 1) as follows:

- If the ESRI signal of the previous month is 1 or -1, then ESRI signal set to be the same as previous month.
- Else determine the ESRI signal as if this is the first monthly ESRI rebalance in the quarter.

If restated values of ESRI Indexes of Business Conditions are available for previous months, they will be used in the evaluation of the current three trailing monthly ESRI coincident diffusion readings. However, the index will not revise previously evaluated results from previous index rebalancing events.

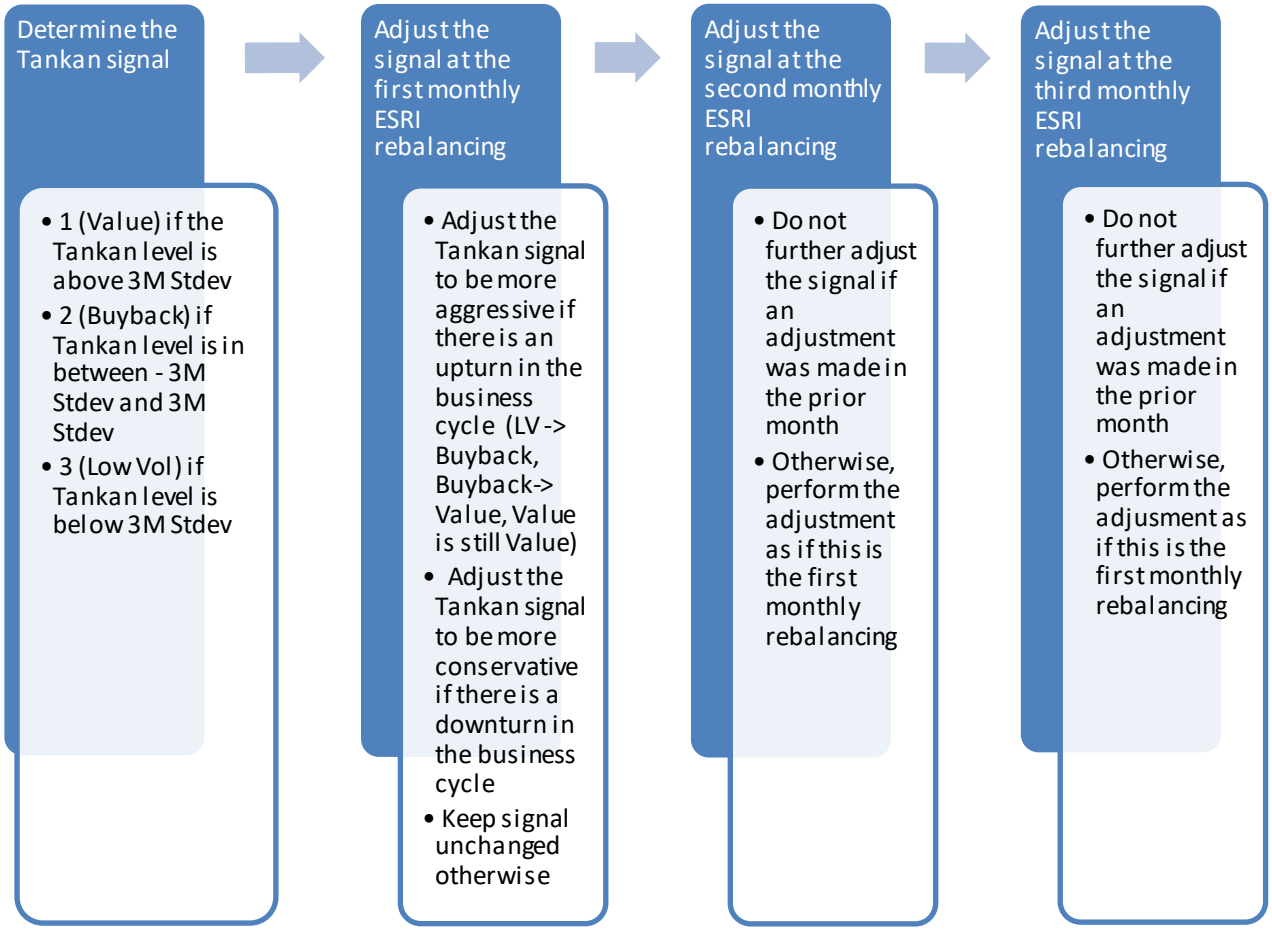
On each index rebalancing, determine the combined signal as follow:

- If it is a quarterly Tankan rebalancing date, the combined signal is the Tankan signal.
- If it is a monthly ESRI rebalancing date, the combined signal is equal to the Tankan signal plus the ESRI signal, capped by 1 and 3.

The combined signal is used to determine which strategy is targeted, as defined below:

- If the combined signal equals 1 the Value strategy is targeted
- If the combined signal equals 2 the Buyback strategy is targeted
- If the combined signal equals 3 the Low Volatility strategy is targeted

The flow chart below visually depicts the process for the calculation of the index:



At each monthly rebalancing, an indicator vector, $\vec{v}_t$, is used to identify the target portfolio deployed at time *t* and is defined as follows:

For month *k*,

If Equity allocated index (*k*) is Value, then $\vec{v}_t = \{1,0,0\}$

If Equity allocated index (*k*) is Buyback, then $\vec{v}_t = \{0,1,0\}$

If Equity allocated index (*k*) is Low Volatility, then $\vec{v}_t = \{0,0,1\}$

Furthermore, ${\vec{v}_t}^i$ returns the i[th] value of the vector at time *t*.

For example, if the style at time *t* is 3, then ${\vec{v}_t}^3 = 1$, and ${\vec{v}_t}^1 = {\vec{v}_t}^2 = 0$.

Target Allocation Scheme for the S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index

The S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index is allocated to the "U.S. Rotator Index", "Europe Rotator Index", and "Japan Rotator Index" with pre-determined proportion on daily basis, subject to a volatility-adjusted exposure factor. Target proportions for each regional rotator index are indicated in the table below.

Symbols	Description	Values
$w_{U.S.}$	Target proportion of "U.S. Rotator Index"	50%
w_{Europe}	Target proportion of "Europe Rotator Index"	30%
w_{Japan}	Target proportion of "Japan Rotator Index"	20%
TV	Target Volatility	4.5%

To achieve the desired risk level, the index calculates the 21-day and 63-day realized volatility (RV) for the hypothetical portfolio:

$$RV_{21D,t} = \sqrt{\frac{\sum_{i=1}^{21}(R_{t-i+1} - \overline{R_{t,21D}})^2}{21-1} * 252}$$

$$RV_{63D,t} = \sqrt{\frac{\sum_{i=1}^{63}(R_{t-i+1} - \overline{R_{t,63D}})^2}{63-1} * 252}$$

where:

$$R_t = w_{U.S.} * USRotatorReturn_{t,USD} + w_{Europe} * EuropeRotatorReturn_{t,USDHedged} + w_{Japan} * JapanRotatorReturn_{t,USDHedged}$$

$\overline{R_{t,21D}}$ =the 21-day average of the portfolio returns

$\overline{R_{t,63D}}$ =the 63-day average of the portfolio returns

Exposure as of time t is defined as follows:

$$Exposure_t = \min(100\%, \frac{TV}{RV_{21D,t}}, \frac{TV}{RV_{63D,t}})$$

The target weight for i-th rotator index for day t is calculated as follows:

$$TargetWeight_{t,i} = Exposure_{t-2} * w_i$$

Please note: The number of units invested in each regional rotator index at day *t* after the market close is pre-determined based on the index level of the S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index, the index level and target weight of this regional rotator index as of day *t*-2. Therefore, the effective weight allocated to this regional rotator index at day *t* is slightly different from its target weight determined at day *t*-2.

Index Returns and Level Calculations for the "U.S. Rotator Index", "European Rotator Index", and "Japan Rotator Index"

The next step in the formation of the Rotator Index is to calculate the daily index returns and levels for each Sub-Index. The daily index levels of the Rotator Index in any given month are calculated using the daily returns of the target portfolio selected for the given month. Let each risk controlled sub-index for each target portfolio style be defined as:

For the U.S. Rotator and European Rotator:

Momentum $= Subindex_t^1$

Value $= Subindex_t^2$

Buyback $= Subindex_t^3$

Low Volatility High Dividend $= Subindex_t^4$

For the Japan Rotator:

Value $= Subindex_t^1$

Buyback $= Subindex_t^2$

Low Volatility $= Subindex_t^3$

The final step in the formation of the Rotator Index is to calculate the overall Rotator Index return and level. Using the indicator vector as defined above, $\vec{v}_t$, the daily returns are computed by summing all the style risk controlled sub-indices. The indicator serves to select the appropriate target portfolio for time t.

$$IndexDailyReturn_t = \sum_{i=1}^{n} \vec{v}_t^i \left(\frac{Subindex_t^i}{Subindex_{rebalancing}^i} - 1 \right)$$

$$IndexValue_t = IndexValue_{t-1} * (1 + IndexDailyReturns_t)$$

n is the number of equity factor strategies available for selection for applicable region.

Index Returns and Level Calculations for the S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index

On any business day *t* when the index is calculated, the following formula is used to calculate both the index levels and index returns:

$$IndexDailyReturn_t = weight_{t,US} * USRotatorReturn_{t,USD} + weight_{t,Europe} * EuropeRotatorReturn_{t,USDHedged} + weight_{t,Japan} * JapanRotatorReturn_{t,USDHedged}$$

$$IndexValue_t = IndexValue_{t-1} * (1 + IndexDailyReturns_t)$$

Where:

$weight_t$ is the effective weight assigned for each regional rotator index to be effective on time t

Equity-Only Rotator Indices

The Equity-Only Rotator Indices allocate among the same set of Target Strategies, but the sub-indices equate directly to the underlying component equity indices only. There is no excess return calculation or risk control calculation involved in these indices.

Each Target Strategy is represented as shown below:

Rotator Index	Target Strategy	Equity Index
S&P Economic Cycle Factor Rotator Index ("U.S. Rotator Index")	Momentum	S&P Momentum United States LargeMidCap Index (US Dollar)
	Value	S&P 500 Pure Value
	Buyback	S&P 500 Buyback FCF Index
	Low Volatility High Dividend	S&P 500 Low Volatility High Dividend Index
S&P Europe 350 Economic Cycle Factor Rotator Index ("European Rotator Index")	Momentum	S&P Europe 350 Momentum Index (EUR)
	Value	S&P Europe 350 Enhanced Value Index (EUR)
	Buyback	S&P Europe 350 Buyback Index (EUR)
	Low Volatility High Dividend	S&P Europe 350 low Volatility High Dividend Index (EUR)
S&P Japan Economic Cycle Factor Rotator Index ("Japan Rotator Index")	Value	S&P Enhanced Value Japan LargeMidCap Index (JPY)
	Buyback	S&P Japan 500 Buyback FCF Index (JPY)
	Low Volatility	S&P Japan 500 Low Volatility Index (JPY)

There are three versions of the Equity-Only Rotator Indices, in which the equity index that represents each target strategy will all be based on the Price Return, Total Return, or Net Total Return index values.

The target strategy allocation determination is based on each indices corresponding economic indicator and is conducted the same way as detailed above in the "Target Style Allocation Scheme" section.

The Equity-Only Rotator Index level is calculated in the same was as detailed above in the "Index Returns and Level calculations" section.

Long/Short Rotator Indices for the "U.S. Rotator Index"

The S&P Economic Cycle Factor Rotator Dynamic Long/Short Index (USD) ER index allocates among the same set of Target and Smart Beta Strategies based on the economic signal. The sub-index for the targeted strategy is selected between a Beta Risk Control Sub-Index (Long Smart Beta, Short Cash, 6% Risk Control) and an Alpha Risk Control Sub-Index (Long Smart Beta, Short S&P 500 Total Return Index, 6% Risk Control) based on a market momentum signal. If the 1-month (21-day) moving average of the S&P 500 is below its 18-month (375-day) moving average at end of the month, then the index will allocate to the Alpha Risk Control Sub-Index for the next month. Else it will allocate to the Beta Risk Control Sub-Index. The index is available only in one excess return type based on the price returns of the component equity indices.

Each Target Strategy is represented as shown below:

Sub-index	Asset Class	Sub-Components		Ticker
S&P Momentum Daily Risk Control 6% Long/Short Excess Return Index ("Alpha Risk Control")	Equity	S&P Momentum United States LargeMidCap (USD) Long/Short Excess Return		SPUSMULS
	Fixed Income	Bond Future	S&P 5-Year U.S. Treasury Note Futures Excess Return Index	SPUST5P
	Cash[15]	SOFR Overnight + 0.13088%		SOFRS3M=

Sub-index	Asset Class	Sub-Components		Ticker
S&P Value Daily Risk Control 6% Long/Short Excess Return Index ("Alpha Risk Control")	Equity	S&P 500 Pure Value Long/Short Excess Return		500PVLS
	Fixed Income	Bond Future	S&P 5-Year U.S. Treasury Note Futures Excess Return Index	SPUST5P
	Cash[15]	SOFR Overnight + 0.13088%		SOFRS3M=

[15] Cash items are used in calculating the excess return; the indices do not hold cash.

Sub-index	Asset Class	Sub-Components		Ticker
S&P Buyback Long/Short Daily Risk Control 6% Excess Return Index ("Alpha Risk Control")	Equity	S&P 500 Buyback FCF Index Long/Short Excess Return		SPBUYFULS
	Fixed Income	Bond Future	S&P 5-Year U.S. Treasury Note Futures Excess Return Index	SPUST5P
	Cash[16]	SOFR Overnight + 0.13088%		SOFRS3M=

Sub-index	Asset Class	Sub-Components		Ticker
S&P Low Volatility High Dividend Long/Short Daily Risk Control 6% Excess Return Index ("Alpha Risk Control")	Equity	S&P 500 Low Volatility High Dividend Long/Short Excess Return		SP5LVHDLS
	Fixed Income	Bond Future	S&P 5-Year U.S. Treasury Note Futures Excess Return Index	SPUST5P
	Cash[16]	SOFR Overnight + 0.13088%		SOFRS3M=

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

Beta-Neutral Rotator Indices for the "Japan Rotator Index"

The S&P Japan Beta-Neutral Economic Cycle Factor Rotator Index (JPY) allocates among the same set of Target Smart Beta Strategies based on the economic signals. The sub-index for the targeted strategy is constructed by taking on a long position in the target equity factor net total return index and a short position in the S&P Japan 500 Total Return Index based on the past 126-day beta of the target equity factor index relative to the S&P Japan 500 to achieve beta-neutral (beta of 0). At each Tankan or ESRI rebalancing date, the 126-day beta is recalculated based on the daily returns of the target equity factor net total return index and S&P Japan 500 Total Return Index over the past 126 days up to the end of the prior business date of the Tankan or ESRI rebalancing date. Interest costs incurred by borrowing funds to take the long position, and interest earned in the short position, are both accounted in the return calculation.

Each Target Strategy is represented as shown below:

Sub-index	Asset Class	Sub-Components	Ticker
S&P Japan Value Beta Neutral Index ("Beta Neutral")	Long	S&P Enhanced Value Japan LargeMidCap Net Total Return Index (JPY)	SEVJXJN
	Short	S&P Japan 500 Total Return Index (JPY)	SPJ500TR
	Cash[17]	1-Month TIBOR interest rate	DIBJP1MD=
		3-Month TIBOR interest rate	DIBJP3MD=

Sub-index	Asset Class	Sub-Components	Ticker
S&P Japan Buyback Beta Neutral Index ("Beta Neutral")	Long	S&P Japan 500 Buyback FCF Net Total Return Index (JPY)	SPJBFJN
	Short	S&P Japan 500 Total Return Index (JPY)	SPJ500TR
	Cash[17]	1-Month TIBOR interest rate	DIBJP1MD=
		3-Month TIBOR interest rate	DIBJP3MD=

Sub-index	Asset Class	Sub-Components	Ticker
S&P Japan Low Volatility Beta Neutral Index ("Beta Neutral")	Long	S&P Japan 500 Low Volatility Index Net Total Return Index (JPY)	SPJ5LVJN
	Short	S&P Japan 500 Total Return Index (JPY)	SPJ500TR
	Cash[17]	1-Month TIBOR interest rate	DIBJP1MD=
		3-Month TIBOR interest rate	DIBJP3MD=

[16] Cash items are used in calculating the excess return; the indices do not hold cash.
[17] Cash items are used in calculating the interest incurred by borrowing fund to take the long position and the interest earned in the short position.

The indicator vector, $\vec{v}_{bebalance}$, is used to define the target beta-neutral factor portfolio determined at the last Tankan or ESRI rebalancing date. The periodic return of the Beta-Neutral Rotator Index since the last Tankan or ESRI rebalancing date to time *t* is computed by summing all three beta-neutral factor sub-indices (i) as shown below:

$$IndexPeriodReturn_{rebalance,t} = \sum_{i=1}^{3} \vec{v}^{i}_{rebalance}[\left(\frac{NTRIndex^{i}_{t}}{NTRIndex^{i}_{rebalance}} - 1\right) - \beta^{i}_{rebalance} * \left(\frac{Index^{short\ leg}_{t}}{Index^{short\ leg}_{rebalance}} - 1\right) + \left(\beta^{i}_{rebalance} - 1\right) * \left(\frac{Index^{cash}_{t}}{Index^{cash}_{rebalance}} - 1\right)]$$

$$IndexValue_{t} = IndexValue_{rebalance} * (1 + IndexPeriodReturns_{rebalance,t})$$

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

Index Maintenance

Rebalancing

U.S. Rotator Index and European Rotator Index. The indices rebalance monthly after the market close on the first business day of each month. Index allocation changes are typically announced three business days prior to the rebalancing date.

Japan Rotator Index. At each quarterly Tankan rebalancing the index rebalances after the market close on the third business day of the following month after the previous calendar quarter end. At each monthly ESRI rebalancing date, the index rebalances on the 15th calendar day of every month, or the next immediately available index business day (to account for the ESRI publication calendar).

S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index. The index rebalances daily after the market close.

The target portfolios (sub-indices) rebalance in accordance with S&P Dow Jones Indices' Risk Control 2.0 Indices Methodology. The target portfolios for the equity-only versions rebalance in accordance with each respective underlying index methodology.

For information on the component equity indices, please refer to the S&P Momentum Indices Methodology, S&P U.S. Style Indices Methodology, S&P Enhanced Value Indices Methodology, S&P Buyback FCF and PE Indices Methodology, S&P Europe 350 Buyback Index Methodology, S&P Low Volatility High Dividend Indices Methodology, and S&P Low Volatility Indices Methodology, respectively.

For further information on the Risk Control 2.0 Methodology, please refer to S&P Dow Jones Indices' Index Mathematics Methodology. All methodologies are available at www.spglobal.com/spdji/.

Additions and Deletions. Component indices are not expected to change between rebalancing periods. If a constituent is discontinued, the Index Committee may elect to discontinue representation of the affected asset class within the index or designate a successor component index.

Currency of Calculation and Additional Index Return Series

U.S. Rotator Indices, associated components, and the S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index are calculated in U.S. dollars. European Rotator Indices and associated components are calculated in euros. Japan Rotator Indices and associated components are calculated in Japanese yen.

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

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.spglobal.com/spdji/.

Base Date and History Availability

Index history availability, base dates, and base values are shown in the table below.

Index[18]	Launch Date	First Value Date	Base Date	Base Value
U.S. Factor Rotator Indices				
S&P Economic Cycle Factor Rotator Index	08/16/2016	08/01/1995	08/01/1995	100
S&P Economic Cycle Factor Rotator (Cash Bond) Index (USD)	02/16/2018	08/01/1995	08/01/1995	100
S&P Economic Cycle Factor Rotator Dynamic Long/Short Index (USD) ER	12/21/2018	08/01/1995	08/01/1995	100
S&P Economic Rotator Index NTR – Equity Only	06/08/2017	01/02/2001	01/02/2001	100
S&P Economic Rotator Index PR – Equity Only	06/08/2017	07/03/1995	07/03/1995	100
S&P Economic Rotator Index TR – Equity Only	06/08/2017	07/03/1995	07/03/1995	100
S&P Momentum Daily Risk Control 6% Excess Return Index	08/16/2016	08/01/1995	08/01/1995	100
S&P Value Daily Risk Control 6% Excess Return Index	08/16/2016	08/01/1995	08/01/1995	100
S&P Buyback Daily Risk Control 6% Excess Return Index	08/16/2016	08/01/1995	08/01/1995	100
S&P Low Volatility High Dividend Daily Risk Control 6% Excess Return Index	08/16/2016	08/01/1995	08/01/1995	100
S&P Momentum United States LargeMidCap Daily Risk Control 6% Long/Short Index (USD) ER	12/21/2018	08/01/1995	08/01/1995	100
S&P 500 Pure Value Daily Risk Control 6% Long/Short Index (USD) ER	12/21/2018	08/01/1995	08/01/1995	100
S&P 500 Buyback Daily Risk Control 6% Long/Short Index (USD) ER	12/21/2018	08/01/1995	08/01/1995	100
S&P 500 Low Volatility High Dividend Daily Risk Control 6% Long/Short Index (USD) ER	12/21/2018	08/01/1995	08/01/1995	100
European Factor Rotator Indices				
S&P Europe 350 Economic Cycle Factor Rotator Index (EUR)	12/21/2018	24/01/2002	24/01/2002	100
S&P Europe 350 Economic Rotator Index (EUR) NTR – Equity Only	12/21/2018	24/01/2002	24/01/2002	100
S&P Europe 350 Economic Rotator Index (EUR)– Equity Only	12/21/2018	24/01/2002	24/01/2002	100
S&P Europe 350 Economic Rotator Index (EUR) TR – Equity Only	12/21/2018	24/01/2002	24/01/2002	100
S&P Europe 350 Momentum Daily Risk Control 6% Index (EUR) ER	12/21/2018	24/01/2002	24/01/2002	100
S&P Europe 350 Enhanced Value Daily Risk Control 6% Index (EUR) ER	12/21/2018	24/01/2002	24/01/2002	100
S&P Europe 350 Buyback Daily Risk Control 6% Index (EUR) ER	12/21/2018	24/01/2002	24/01/2002	100
S&P Europe 350 Low Volatility High Dividend Daily Risk Control 6% Index (EUR) ER	12/21/2018	24/01/2002	24/01/2002	100
Japan Factor Rotator Indices				
S&P Japan Economic Cycle Factor Rotator Index (JPY)	04/01/2019	04/01/2004	04/01/2004	100
S&P Japan Economic Cycle Factor Rotator Index (JPY) – Equity Only	04/01/2019	04/01/2004	04/01/2004	100
S&P Japan Economic Cycle Factor Rotator Index (JPY) TR – Equity Only	04/01/2019	04/01/2004	04/01/2004	100
S&P Japan Economic Cycle Factor Rotator Index (JPY) NTR – Equity Only	04/01/2019	04/01/2004	04/01/2004	100
S&P Japan Beta-Neutral Economic Cycle Factor Rotator Index (JPY)	04/01/2019	10/15/2004	10/15/2004	100
S&P Japan Value Daily Risk Control 6% Excess Return Index (PR)	04/01/2019	04/01/2004	04/01/2004	100
S&P Japan Buyback Daily Risk Control 6% Excess Return Index (PR)	04/01/2019	04/01/2004	04/01/2004	100
S&P Japan Low Volatility Daily Risk Control 6% Excess Return Index (PR)	04/01/2019	04/01/2004	04/01/2004	100
Global Factor Rotator Indices				
S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index	09/16/2019	07/30/2004	07/30/2004	100

[18] Dates and base values are the same for related index versions (i.e., those based on the component equity price return index and total return index or those based on excess return and non-excess return).

Index Governance

Index Committee

An S&P Dow Jones Indices Index Committee maintains the indices. All committee members are full-time professional members of S&P Dow Jones Indices' staff. The Committee meets regularly. At each meeting, the Committees may revise index policy covering rules for including other assets or asset classes, changes to target weight allocations, currencies, the 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

- U.S. Rotator Indices and associated components calculate on all U.S. equities market business days.
- European Rotator Indices and associated components calculate on all European equities market business days.
- Japan Rotator Indices and associated components calculate on all Japanese equities market business days.
- The S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index is calculated when three regional rotator indices all have values.

Complete holiday schedules for the year are available at www.spglobal.com/spdji/.

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.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 *S&P DJI Methodology & Regulatory Status Database* for a complete list of indices covered by this document.

Index	Bloomberg
U.S. Factor Rotator Indices	
Indices based on component equity price return indices:	
S&P Economic Cycle Factor Rotator Index	SPECFR6P
S&P Economic Cycle Factor Rotator (Cash Bond) Index (USD)	SPECFR6B
S&P Economic Cycle Factor Rotator Dynamic Long/Short Index (USD) ER	SPECFRLS
S&P Economic Rotator Index PR – Equity Only	SPECFRP
S&P Momentum Daily Risk Control 6% Excess Return Index (PR)	SPECFM6P
S&P Value Daily Risk Control 6% Excess Return Index (PR)	SPECFV6P
S&P Buyback Daily Risk Control 6% Excess Return Index (PR)	SPECFB6P
S&P Low Volatility High Dividend Daily Risk Control 6% Excess Return Index (PR)	SPECFL6P
S&P Momentum United States LargeMidCap Daily Risk Control 6% Long/Short Index (USD) ER	SPECFMLS6P
S&P 500 Pure Value Daily Risk Control 6% Long/Short Index (USD) ER	SPECFVLS6P
S&P 500 Buyback Daily Risk Control 6% Long/Short Index (USD) ER	SPECFBLS6P
S&P 500 Low Volatility High Dividend Daily Risk Control 6% Long/Short Index (USD) ER	SPECFLLS6P
Indices based on component equity total return indices:	
S&P Economic Cycle Factor Rotator Index (TR)	SPECFR6T
S&P Economic Rotator Index TR – Equity Only	SPECFRT
S&P Momentum Daily Risk Control 6% Excess Return Index (TR)	SPECFM6T
S&P Value Daily Risk Control 6% Excess Return Index (TR)	SPECFV6T
S&P Buyback Daily Risk Control 6% Excess Return Index (TR)	SPECFB6T
S&P Low Volatility High Dividend Daily Risk Control 6% Excess Return Index (TR)	SPECFL6T
Indices based on component equity net total return indices:	
S&P Economic Rotator Index NTR – Equity Only	SPECFRN
European Factor Rotator Indices	
Indices based on component equity price return indices:	
S&P Europe 350 Economic Cycle Factor Rotator Index (EUR) ER	SPEEC6EP
S&P Europe 350 Economic Cycle Factor Rotator Index (EUR)	SPEECF6P
S&P Europe 350 Economic Rotator Index (EUR) – Equity Only	SPEECFRP
S&P Europe 350 Momentum Daily Risk Control 6% Index (EUR) ER	SPEEM6EP
S&P Europe 350 Enhanced Value Daily Risk Control 6% Index (EUR) ER	SPEEV6EP
S&P Europe 350 Buyback Daily Risk Control 6% Index (EUR) ER	SPEEB6EP
S&P Europe 350 Low Volatility High Dividend Daily Risk Control 6% Index(EUR) ER	SPEEL6EP
S&P Europe 350 Momentum Daily Risk Control 6% Index (EUR)	SPEECM6P
S&P Europe 350 Enhanced Value Daily Risk Control 6% Index (EUR)	SPEECV6P
S&P Europe 350 Buyback Daily Risk Control 6% Index (EUR)	SPEECB6P
S&P Europe 350 Low Volatility High Dividend Daily Risk Control 6% Index (EUR)	SPEECL6P
Indices based on component equity total return indices:	
S&P Europe 350 Economic Rotator Index (EUR) TR – Equity Only	SPEECFRT
Indices based on component equity net total return indices:	
S&P Europe 350 Economic Rotator Index (EUR) NTR – Equity Only	SPEECFRN

Index	Bloomberg
Japan Factor Rotator Indices	
Indices based on component equity price return indices:	
S&P Japan Economic Cycle Factor Rotator Index (JPY)	SPJECF6P
S&P Japan Economic Cycle Factor Rotator Index (JPY) – Equity Only	SPJECFP
S&P Japan Value Daily Risk Control 6% Excess Return Index (PR)	SPJECV6P
S&P Japan Buyback Daily Risk Control 6% Excess Return Index (PR)	SPJECB6P
S&P Japan Low Volatility Daily Risk Control 6% Excess Return Index (PR)	SPJECL6P
Indices based on component equity total return indices:	
S&P Japan Economic Cycle Factor Rotator Index (JPY) TR – Equity Only	SPJECFT
Indices based on component equity net total return indices:	
S&P Japan Economic Cycle Factor Rotator Index (JPY) NTR – Equity Only	SPJECFN
S&P Japan Beta-Neutral Economic Cycle Factor Rotator Index (JPY)	SPJECFBN
Global Economic Rotator Indices	
S&P U.S., Europe, and Japan Economic Cycle Factor Rotator Index	SPECFREU

Index Data

Daily index level data is 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 I

The target portfolios (sub-indices) for each rotator index are calculated on a daily risk control basis with a target volatility of 6%, short-term decay factor of 94%, long-term decay factor of 97%, in accordance with S&P Dow Jones Indices' Risk Control 2.0 Indices Methodology. The sub-indices are each constructed from one factor-based equity index, and one fixed income index as shown below:

Target Strategy	Equity Index	Fixed Income Index
Momentum	S&P Momentum United States LargeMidCap (USD) Excess Return	S&P 5-Year U.S. Treasury Note Futures Excess Return Index Or S&P U.S. Treasury Bond 5-7 Year Excess Return Index
Value	S&P 500 Pure Value Excess Return	
Buyback	S&P 500 Buyback FCF Index Excess Return	
Low Volatility High Dividend	S&P 500 Low Volatility High Dividend Excess Return	
Momentum	S&P Europe 350 Momentum Daily Risk Control 6% Index (EUR) ER	S&P Euro-Bund Futures Excess Return Index
Value	S&P Europe 350 Enhanced Value Daily Risk Control 6% Index (EUR) ER	
Buyback	S&P Europe 350 Buyback Daily Risk Control 6% Index(EUR) ER	
Low Volatility High Dividend	S&P Europe 350 Low Volatility High Dividend Daily Risk Control 6% Index (EUR) ER	
Momentum	S&P Europe 350 Momentum Daily Risk Control 6% Index (EUR)	S&P Euro-Bund Futures Total Return Index
Value	S&P Europe 350 Enhanced Value Daily Risk Control 6% Index (EUR)	
Buyback	S&P Europe 350 Buyback Daily Risk Control 6% Index (EUR)	
Low Volatility High Dividend	S&P Europe 350 Low Volatility High Dividend Daily Risk Control 6% Index (EUR)	
Value	S&P Japan Value Daily Risk Control 6% Excess Return Index (PR)	S&P 10-Year JGB Futures Excess Return Index
Buyback	S&P Japan Buyback Daily Risk Control 6% Excess Return Index (PR)	
Low Volatility	S&P Japan Low Volatility Daily Risk Control 6% Excess Return Index (PR)	

The weightings of the equity and fixed income exposures within the target portfolios are based on their individual portfolio volatilities, except for the following difference: when there is no solution to the quadratic, the weights are reduced until the target volatility is achieved, with the weights restricted to a maximum of 100% and a minimum of 0%.

For more information on the Risk Control 2.0 Indices Methodology and excess return index calculations, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.

Appendix II

The USD hedged versions of the S&P Europe 350 Economic Cycle Factor Rotator (EUR) ER and S&P Japan Economic Cycle Factor Rotator Index (JPY) calculate on a monthly hedged basis.

Since an excess return index calculates the return on an investment in an index where the investment was made through the use of borrowed funds, currency risk can be hedged by borrowing funds in the currency of the investment. In this scenario the initial value of the index at each hedge period will not be affected by currency returns, but the amount gained or lost during the period will be affected by returns in the currency.

The calculation is shown as below:

$$IndexCumReturn(USDHedged)_t = \left(\frac{IndexValue(LOC)_t}{IndexValue(LOC)_{tb}} - 1\right) * \left(\frac{ExchangeRate(USD/LOC)_t}{ExchangeRate(USD/LOC)_{tb}}\right)$$

where:

$ExchangeRate(USD/LOC)_t$ = U.S. dollars per local currency at time *t*

$IndexValue(LOC)_t$ = The index level in local currency at time *t*

$IndexValue(LOC)_{tb}$ = The index level in local currency at last rebalance date (the first business of each month)

$$IndexValue(USDHedged)_t = IndexValue(USDHedged)_{tb} * (1 + IndexCumReturns(USDHedged)_t)$$

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

Appendix III

Methodology Changes

Methodology changes since August 16, 2016, are as follows:

Change	Effective Date (After Close)	Methodology	
		Previous	Updated
Economic Indicator Replacement: S&P Europe 350 Economic Cycle Factor Rotator Index	04/24/2023	OECD Europe Composite Leading Indicator	OECD Four Big European Composite Leading Indicator
USD Interest Rate Replacement	12/17/2021	2-Month US Dollar LIBOR interest rate 3-Month US Dollar LIBOR interest rate	SOFR Overnight + 0.13088%
JPY Interest Rate Replacement	11/19/2021	2-Month ICE LIBOR JPY interest rate 3-Month ICE LIBOR JPY interest rate	1-Month TIBOR interest rate 3-Month TIBOR interest rate
Index Name Change: S&P Economic Cycle Factor Rotator Dynamic Long/Short Index (USD) ER	01/11/2019	The index name was "S&P Economic Cycle Factor Rotator Long/Short Index (USD) ER".	The index name is "S&P Economic Cycle Factor Rotator Dynamic Long/Short Index (USD) ER".

Appendix IV

ESG Disclosures

EXPLANATION OF HOW ENVIRONMENTAL, SOCIAL & GOVERNANCE (ESG) FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY[19]		
1.	**Name of the benchmark administrator.**	S&P Dow Jones Indices LLC.
2.	**Underlying asset class of the ESG benchmark.[20]**	N/A
3.	**Name of the S&P Dow Jones Indices benchmark or family of benchmarks.**	S&P DJI Multi-Asset Indices Benchmark Statement
4.	**Do any of the indices maintained by this methodology take into account ESG factors?**	No
Appendix latest update:		January 2021
Appendix first publication:		January 2021

[19] The information contained in this Appendix is intended to meet the requirements of the European Union Commission Delegated Regulation (EU) 2020/1817 supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council as regards the minimum content of the explanation of how environmental, social and governance factors are reflected in the benchmark methodology and the retained EU law in the UK [The Benchmarks (amendment and Transitional Provision) (EU Exit) Regulations 2019].

[20] The 'underlying assets' are defined in European Union Commission Delegated Regulation (EU) 2020/1816 supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council as regards the explanation in the benchmark statement of how environmental, social and governance factors are reflected in each benchmark provided and published.

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 in 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. 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.

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