S&P Dow Jones Indices

A Division of S&P Global

S&P 500 FC TCA Indices

Methodology

September 2023

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Introduction

Index Objective and Highlights

The S&P 500 FC TCA Indices are based on the "Fast Convergence" methodology developed by and licensed from BofA Securities, which includes a risk control mechanism that uses an intraday volatility rebalancing methodology based on time-weighted average prices (TWAPs) of S&P 500 Futures calculated during different time windows during the trading day.

The index aims to control intraday realized volatility and adapt faster to changing market conditions than a traditional index that rebalances only end-of-day. The index also aims to mitigate drawdowns and improve risk adjusted returns.

The index was developed in collaboration with BofA Securities.

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

For more information on the Fast Convergence methodology, please contact BofA Securities.

Index Family and Parameters

Table 1

Index	Volatility Target (VolTarget)	Maximum Leverage (LevMax)	Leverage Change Floor (LevFloor)	Leverage Change Cap (LevCap)	Transaction Cost (tcost)	Carry Cost (carrycost)
S&P 500 FC TCA Index (USD) ER	11.5%	175%	25%	15%	0.01%	0%
S&P 500 FC TCA 0.50% Decrement Index (USD) ER	11.5%	175%	25%	15%	0.01%	0.50%

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

This methodology is designed 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

Index Calculations

For each index calculation day, the index calculates multiple times using intraday calculation windows. The closing level of the index is the index level calculated at the end of the last intraday calculation window.

$$\text{Index closing level } (\mathrm{ICL^t}) = \text{Value of } \mathrm{FCVHL_h^t} \text{ at end of last window } h \text{ on day } t$$

where:

$FCVHL_h^t$ = The intraday index level calculated at the end of calculation window *h* on day *t*

On the index initialization date, $FCVHL_{last}^t = 100$. For every subsequent calculation window, *h*,

$$FCVHL_h^t = \mathrm{FCVHL_{h-1}^t} \times [1 + \mathrm{participation_{h-1}^t} \times \left(\frac{\mathrm{Eq_h^t}}{\mathrm{Eq_{h-1}^t}} - 1\right) - \text{carry cost} \times \frac{\mathrm{Days_{h-1,h}^t}}{360} - \text{tcost} \times \text{abs}(\mathrm{participation_h^t} - \mathrm{pariticipation_{h-1}^t})] \quad (1)$$

where:

$participation_h^t$ = The equity participation level calculated at the end of calculation window *h* on day *t*, as defined in (2a) and (2b)

Eq_h^t = The equity intraday level calculated at the end of calculation window *h*

$Days_{h-1,h}^t$ = The number of calendar days between the date associated with calculation window *h-1* and calculation window *h*

$tcost$ = Transaction cost value, as defined in *Table 1*

On the index initialization date, the equity participation level calculates as:

$$participation_{last}^t = \min\left(LevMax, \frac{Vol\,Target}{EqVol_{last-1}^t}\right) \quad (2a)$$

For every subsequent calculation window, *h*,

$$participation_h^t = \max\left(participation_{h-1}^t - LevFloor, \min(TargetPar_h^t, participation_{h-1}^t + LevCap)\right) \quad (2b)$$

where:

$TargetPar_h^t$ = The target equity participation level calculated at the end of calculation window *h* on day *t*, as defined in (3)

$EqVol_{last-1}^t$ = The volatility of the equity intraday level calculated at the end of the penultimate calculation window on day *t*, as defined in (4a)

$Vol\,Target$ = The target volatility level, as defined in *Table 1*

$LevMax$ = The maximum allowed leverage, as defined in *Table 1*

$LevFloor$ = The maximum amount by which the current participation value can be below the previous participation value, as defined in *Table 1*

$LevCap$	= The maximum amount by which the current participation value can be above the previous participation value, as defined in *Table 1*

The target equity participation level calculates as follows:

$$TargetPar_h^t = \min\left[LevMax, \left(\frac{Vol\,Target}{EqVol_{h-1}^t} \times \left(1 + rounding(ExpAdj_{h-1}^t)\right) \times VAF_h^t\right)\right] \quad (3)$$

where:

$ExpAdj_h^t$	= The exposure adjustment calculated at the end of calculation window *h* on day *t*, as defined in (9)
$EqVol_h^t$	= The volatility of the equity intraday level calculated at the end of calculation window *h* on day *t*, as defined in (4b)
VAF_h^t	= The volatility adjustment factor calculated at the end of calculation window *h* on day *t*, as defined in (6)
$rounding()$	= A function that will round the value to 2 decimal places

On the index initialization date, the volatility of the equity intraday level calculates for the past 160 trading windows as:

$$EqVol_{last-1}^t = \sqrt{\frac{252 \times NbW}{159} \sum_{past\ 160} \left[\ln\left(\frac{Eq_h^t}{Eq_{h-1}^t}\right)^2\right]} \quad (4a)$$

For every subsequent calculation window, *h*,

$$EqVol_h^t = \max\left(EqVol_{h,short}^t, EqVol_{h,long}^t\right) \quad (4b)$$

$$EqVol_{h,short}^t = \sqrt{0.94 \times \left(EqVol_{h-1,short}^t\right)^2 + (1 - 0.94) \times 252 \times NbW \times \ln\left(\frac{Eq_h^t}{Eq_{h-1}^t}\right)^2} \quad (5a)$$

$$EqVol_{h,long}^t = \sqrt{0.97 \times \left(EqVol_{h-1,long}^t\right)^2 + (1 - 0.97) \times 252 \times NbW \times \ln\left(\frac{Eq_h^t}{Eq_{h-1}^t}\right)^2} \quad (5b)$$

On the index initialization date, the volatility adjustment factor is set to $VAF_{last}^t = 1$. For the next 120 index calculation days, $VAF_h^t = 1$ for all calculation windows *h*. Subsequently, it calculates as follows:

$$VAF_h^t = \min(Intraday\ 21d\ VAF_h^t, Daily\ 120d\ VAF^t) \quad (6)$$

$$Intraday\ 21d\ VAF_h^t = \min\left(1.2, \max\left[0.8, \sqrt{\max\left(0, 1 + \left(1 - \left[\frac{Intraday\ 21d\ Vol_{h-1}^t}{Vol\,Target}\right]^2\right)\right)}\right]\right) \quad (7a)$$

$$Daily\ 120d\ VAF^t = \min\left(1.2, \max\left[0.8, \sqrt{\max\left(0, 1 + \left(1 - \left[\frac{Daily\ 120d\ Vol^{t-1}}{Vol\,Target}\right]^2\right)\right)}\right]\right) \quad (7b)$$

$$Intraday\ 21d\ Vol_{h-1}^t = \sqrt{252 \times \mathrm{NbW}} \times \mathrm{stdev}\left(\text{past } 21 \times \mathrm{NbW} \text{ values of } \mathrm{Return}(\mathrm{FCVHL}_{h-1}^{t})\right) \quad (8a)$$

$$Daily\ 120d\ Vol^{t-1} = \sqrt{252} \times \mathrm{stdev}\left(\text{past 120 values of } \mathrm{Return}(\mathrm{ICL}^{t-1})\right) \quad (8b)$$

where:

$Return(FCVHL_h^t)$	= The intraday return of intraday index level from calculation window *h-1* to calculation window *h*
$Return(ICL^t)$	= The daily return of the index closing level from day *t-1* to day *t*
$stdev()$	= A function that calculates standard deviation using the *"n-1"* method

NbW = A set number of windows per day

The target participation level of the index adjusts based on a set of hypothetical options based on the equity intraday level, Eq_h^t. The index is not linked to the actual value of any options; no options are traded by the index and the options are not index components. On each index calculation day *t*, the index calculates the delta of one call option and one put option with strikes as defined below, using the last value of the equity intraday level for the previous day, Eq_{last}^{t-1}. The delta of the hypothetical intraday option strangle at the end of calculation window *h* on day *t* calculates as follows:

$$ExpAdj_h^t = \begin{cases} 0 & \text{if calculation window } h \text{ is the last two windows of the day} \\ CallDelta_h^t + PutDelta_h^t & \text{otherwise} \end{cases} \quad (9)$$

To calculate the delta of the call and put option first define:

$$d1(Spot, Strike, ITTE, Volatility) = \frac{\ln\left(\frac{Spot}{Strike}\right) + 0.5 \times (Volatility)^2 \times ITTE}{Volatility \times \sqrt{ITTE}} \quad (10)$$

Then, with $N(x)$ denoting the standard normal cumulative distribution function:

$$\begin{aligned} CallDelta_h^t &= \mathrm{N}[\mathrm{d1}(\mathrm{Eq_h^t}, \mathrm{CallStrike^t}, \mathrm{ITTE_{h+1}^t}, \mathrm{VIX^{t-1}})] \\ PutDelta_h^t &= \mathrm{N}[\mathrm{d1}(\mathrm{Eq_h^t}, \mathrm{PutStrike^t}, \mathrm{ITTE_{h+1}^t}, \mathrm{VIX^{t-1}})] - 1 \end{aligned} \quad (11)$$

where:

$$\begin{aligned} CallStrike^t &= 1.015 \times Eq_{last}^{t-1} \\ PutStrike^t &= 0.985 \times Eq_{last}^{t-1} \\ ITTE_h^t &= \frac{\text{number of minutes from end-time of window } h \text{ to end of trading day } t}{60 \times 24 \times 252} \\ VIX^t &= \frac{\text{Closing level of CBOE VIX Index on day } t}{100} \end{aligned} \quad (12)$$

The equity intraday index level, Eq_h^t, calculates as follows:

$$Eq_h^t = \begin{cases} 100 & \text{if day } t \text{ and window } h \text{ represents 160 windows before index initialization} \\ Eq_{h-1}^t \times \left(\frac{EqPx_{h,60s}^t}{EqPx_{h-1,60s}^t} - F_{t-1} \times \frac{Days_{h-1,h}^t}{360}\right) & \text{otherwise} \end{cases} \quad (13)$$

where:

$$\begin{aligned} F_t &= \text{Int Rate}_t + \max\left[0, \left(\left(1 - \frac{Fut_{last}^t}{EqPx_{last,60s}^t} \cdot \frac{EqPx_{last,60s}^{t-20}}{Fut_{last}^{t-20}}\right) \times \frac{360}{ACT(t-20,t)} - \text{Int Rate}_t\right)\right] \\ EqPx_{h,60s}^t &= TWAP(\text{S\&P 500 Total Return Index Level}, t, StartTime_h, EndTime_h, 60s) \\ Fut_{last}^t &= \text{Value of the rolling futures index at the end of the final window on date } t \\ Days_{h-1,h}^t &= \text{The number of calendar days between the date associated with calculation window } h-1 \text{ and calculation window } h \\ ACT(t-20,t) &= \text{The number of calendar days between date } t-20 \text{ and date } t \\ \text{Int Rate}_t &= \text{Effective Federal Funds Rate on date } t \end{aligned}$$

The rolling futures index, Fut_h^t, calculates as follows:

$$Fut_h^t = \begin{cases} 100 & \text{if day } t \text{ and window } h \text{ represents 160 windows before index initialization} \\ \dfrac{FutPx_{h,60s}^t}{FutPx_{h-1,60s}^t} \times Fut_{h-1}^t & \text{if day } t \text{ is not a futures contract roll day} \\ \dfrac{FutPx_{h,60s}^t}{FutPx_{h-1,60s}^t} \times Fut_{h-1}^t & \text{if day } t \text{ is a futures contract roll day and window } h \text{ is before the second last window of the day} \\ \left(\dfrac{FutPx_{h,60s}^t}{FutPx_{h-1,60s}^t} - 2 \times tcost\right) \times Fut_{h-1}^t & \text{if day } t \text{ is a futures contract roll day and window } h \text{ is the second last window of the day} \\ \dfrac{NewFutPx_{h,60s}^t}{NewFutPx_{h-1,60s}^t} \times Fut_{h-1}^t & \text{if day } t \text{ is a futures contract roll day and window } h \text{ is the last window of the day} \end{cases}$$

where:

$$FutPx_{h,60s}^t = TWAP(\text{E-mini S\&P 500 Futures Current Contract mid-price}, t, StartTime_h, EndTime_h, 60s)$$

$$NewFutPx_{h,60s}^t = TWAP(\text{E-mini S\&P 500 Futures Next Contract mid-price}, t, StartTime_h, EndTime_h, 60s)$$

The roll day for the futures contract is the calculation day four business days before the future expiry date. For example, if the September contract future expires on 09/16/2022, the roll date is 09/12/2022, and starting from 09/12/2022's last calculation window, the rolling futures index value calculates using the December contract future.

For more information on TWAP calculation, please refer to Appendix I.

Index Maintenance

Rebalancing

The index rebalances intraday at the end of each TWAP calculation window. Certain market events impact the calculation timing, as defined below:

- For any trading day scheduled as an early market closure day, the index only calculates those TWAP calculation windows occurring when the market is open.
- On a scheduled early market closure day, the final window starts and ends five minutes later than for non-early market closure days.
- On any trading day which is a day the futures contract roll over, the second-to-last TWAP calculation window starts 30 minutes earlier and ends 20 minutes later.
- For any unscheduled full-day market closure, an intraday closure prior to the end of the last TWAP observation window, or other disruption event affecting TWAP calculation, the rebalancing occurs on the next business day when all necessary data is available.

Intraday index calculations are executed for some index versions whenever the index's primary exchanges are open. If an issue arises during calculation, the index restates for every period following the issue.

For further information on the impact of unavailable pricing on the TWAP calculation, please refer to the Pricing Types section of S&P Dow Jones Indices' Commodities Indices Policies & Practices Methodology.

For information on Calculations and Pricing Disruptions, Expert Judgment and Data Hierarchy, please refer to S&P Dow Jones Indices' Commodities Indices Policies & Practices Methodology.

Currency of Calculation and Additional Index Return Series

The index calculates in U.S. dollars.

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

For information on index calculation, 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

The index history availability, base dates, and base values are shown in the table below.[1]

Index	Launch Date	First Value Date	Base Date	Base Value
S&P 500 FC TCA Index (USD) ER	06/23/2023	12/31/2004	12/31/2004	100
S&P 500 FC TCA 0.50% Decrement Index (USD) ER	06/23/2023	12/31/2004	12/31/2004	100

[1] For history prior to 10/23/2009, due to unavailability of tick data for the S&P 500 Total Return Index, the index calculated using only the S&P 500 E-mini futures. For a detailed description of the historical calculation please refer to *Appendix II.*

Index Governance

Index Committee

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

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

S&P Dow Jones Indices' Index Committees reserve the right to make exceptions when applying the methodology if the need arises. In any scenario where the treatment differs from the general rules stated in this document or supplemental documents, clients will receive sufficient notice, whenever possible.

In addition to the daily governance of indices and maintenance of index methodologies, at least once within any 12-month period, the Index Committee reviews the methodology to ensure the indices continue to achieve the stated objectives, and that the data and methodology remain effective. In certain instances, S&P Dow Jones Indices may publish a consultation inviting comments from external parties.

For information on Quality Assurance and Internal Reviews of Methodology, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

Index Policy

Announcements

All index constituents are evaluated daily for data needed to calculate index levels and returns. All events affecting the daily index calculation are typically announced in advance via the Index Corporate Events report (.SDE), delivered daily to all clients.

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

Holiday Schedule

The index calculates daily, throughout the calendar year, when the U.S. equity markets are open.

A complete holiday schedule for the year is available on S&P Dow Jones Indices' Web site 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' Commodity Indices Policies & Practices Methodology.

Recalculation Policy

Intraday index calculations are executed for some index versions whenever the index's primary exchanges are open. In case an issue arises during calculation and the Index Committee determines that the index should be restated, then based on feasibility assessment by the index committee, every reported intraday index level period is restated following the issue.

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

Index	Bloomberg	RIC
S&P 500 FC TCA Index (USD) ER	SPXFCUE	.SPXFCUE
S&P 500 FC TCA 0.50% Decrement Index (USD) ER	SPXFCDUE	.SPXFCDUE

Index Data

Daily constituent and index level data are available via subscription.

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

Web Site

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

Appendix I

TWAP Calculation

Given an intraday time window defined by a window start time and a window end time, and a set number of fixed intervals throughout the trading day, to calculate an asset's TWAP first group the tick level pricing data as follows:

- The time window is defined as beginning at (and including) the start time and ending at (and excluding) the end time.
- The time window is then split into *k* intervals depending on the provided interval length parameter.
  - For example, assuming a time window start time of 8:30:00 and an end time of 8:45:00, with the *interval* = 60 seconds, there will be *k = 15*, where *k* = the number of 60-second intervals starting at each minute from 8:30 to 8:44.
  - For the same start and end time, if the *interval* = one second, there will be *k = 900* one-second intervals starting at each second from 8:30:00 to 8:44:59.
- To determine the asset price for each interval:
  - If the asset is a futures contract, use the last quoted bid price and the last quoted ask price of the asset in that interval. If either bid price or ask price is unavailable, use the last quoted trade price in that interval.
  - If the asset is an index, use the last available index level in that interval.

If the asset is a futures contract, then:

$$Asset\ Price_{h,k}^{t} = \begin{cases} \dfrac{bid\ px_{h,k}^{t} + ask\ px_{h,k}^{t}}{2} & \text{if both } bid\ px_{h,k}^{t} \text{ and } ask\ px_{h,k}^{t} \text{ exist} \\ last\ px_{h,k}^{t} & \text{if either } bid\ px_{h,k}^{t} \text{ or } ask\ px_{h,k}^{t} \text{ is } N/A \\ N/A & \text{otherwise} \end{cases}$$

If the asset is an index, then:

$$Asset\ Price_{h,k}^{t} = \begin{cases} Index\ Level_{h,k}^{t} & if Index\ Level_{h,k}^{t}\ exists \\ N/A & otherwise \end{cases}$$

where:

$bid\ px_{h,k}^{t}$	= The last quoted bid price in interval *k* of window *h* on day *t*
$ask\ px_{h,k}^{t}$	= The last quoted ask price in interval *k* of window *h* on day *t*
$last\ px_{h,k}^{t}$	= The last quoted trade price in interval *k* of window *h* on day *t*
$Index\ Level_{h,k}^{t}$	= The last available index level in interval *k* of window *h* on day *t*

The TWAP for the asset calculates as:

$$TWAP(Asset, t, StartTime_h, EndTime_h, interval) = \frac{\sum_k \left(\delta_{h,k}^{t} \times Asset\ Price_{h,k}^{t}\right)}{\sum_k \delta_{h,k}^{t}}$$

where:

$$\delta_{h,k}^{t} = \begin{cases} 1 & \text{if } Asset\ Price_{h,k}^{t} \text{ exists} \\ 0 & \text{otherwise} \end{cases}$$

Appendix II

Historical Back-Test Rule Deviations

For history prior to 09/24/2009, the S&P 500 Total Return Index's historical tick data is unavailable. As a minimum of 20 TWAP days are required in order to calculate the financing fee, prior to 10/23/2009 the index was constructed by setting the equity intraday index level, Eq_h^t, to be equal to the rolling futures index, Fut_h^t.

The S&P 500 Total Return Index also lacked historical tick data on the following dates: 11/23/2010, 11/24/2010, 06/03/2013 – 06/06/2013, and 09/30/2016. Tick data was also missing for the third window of 10/02/2012.

For the purposes of calculating the financing fee, the S&P 500 Total Return Index's closing value was used as the equity component on the missing dates.

At the end of all windows on the missing dates, at the end of the first windows of 11/26/2010, 06/07/2013, 10/03/2016, and at the end of the third and fourth windows of 10/02/2012, the equity intraday index level, Eq_h^t, calculated as follows:

$$Eq_h^t = Eq_{h-1}^t \times \left(\frac{Fut_h^t}{Fut_{h-1}^t}\right)$$

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.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate certain ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using "Backward Data Assumption" (or pulling back) of ESG data for the calculation of back-tested historical performance. "Backward Data Assumption" is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as "product involvement") were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on "Backward Data Assumption" please refer to the FAQ. The methodology and factsheets of any index that employs backward assumption in the back-tested history will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used. Index returns shown do not represent the results of actual trading of investable assets/securities. S&P DJI maintains the index and calculates the index levels and performance shown or discussed but does not manage any assets.

Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the Index or investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US $100,000 investment for a 12-month period (or US $10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US $1,650), the net return would be 8.35% (or US $8,350) for the year. Over a three-year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US $5,375, and a cumulative net return of 27.2% (or US $27,200).

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