S&P Dow Jones Indices

A Division of S&P Global

S&P GSCI Dynamic Roll
Methodology

December 2024

S&P Dow Jones Indices: Index Methodology

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Introduction

Index Objective

The S&P GSCI Dynamic Roll (S&P GSCI DR) measures the performance of the same underlying commodities as the S&P GSCI and selects an optimal set of contracts on the futures curve based on a Dynamic Roll Algorithm (DRA) using implied contract roll yields and a Rank Order determination.

Highlights

The S&P GSCI Dynamic Roll Matrix uses a systematic methodology to search for the contract months with the largest roll yield for each commodity along the curve to roll into, subject to buffers and to using only the most liquid of all available contracts of a given commodity.

When the futures curve for a given commodity is in a general state of contango, the S&P GSCI Dynamic Roll methodology will generally use futures contracts months that are further out on the futures curve, with the intention of minimizing the effects of negative roll yields. When the futures curve for a given commodity is in a general state of backwardation, the nature of the S&P GSCI Dynamic Roll methodology, the Index is to generally use nearby futures contracts.

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 hyperlink 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[1]	Commodity Index Mathematics Methodology

This methodology was created by S&P Dow Jones Indices to achieve the 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.

GSCI is a registered trademark of The Goldman Sachs Group, Inc. ("Goldman") and has been licensed for use by S&P Dow Jones Indices. The S&P GSCI index is not created, owned, endorsed, sponsored, sold or promoted by Goldman or its affiliates and Goldman bears no liability with respect to such index or data related thereto. Goldman provides no guarantee as to the accuracy and/or the completeness of the S&P GSCI index or any data related thereto.

[1] Generic formulas previously found in this methodology have been moved to the newly created Commodity Index Mathematics Methodology.

Dynamic Roll Selection Process

The S&P GSCI Dynamic Roll performs the Dynamic Roll Selection Process monthly. Based on the closing values on the roll determination date, the DRA(*k*) algorithms are run for each of the commodities included in the S&P GSCI, based on the respective Rank Orders of the commodities. The Dynamic Roll selections of all the S&P GSCI commodities are assembled into the Monthly Dynamic Roll Schedule (see below). The Monthly Dynamic Roll Schedule is applied to the S&P GSCI Dynamic Roll calculations at the beginning of the S&P GSCI roll period.

For a given S&P GSCI Commodity, the roll schedule follows the S&P GSCI roll schedule, i.e., there is no need to perform the monthly Dynamic Roll Selection Process for those commodities on the months in which the S&P GSCI roll schedule uses the same contracts as in the prior month.

Dynamic Roll Selection for a Given Commodity, *C*

Create a selected forward curve based on the Dynamic Roll Matrix. For any given commodity, *C*, each component of its Dynamic Roll Matrix is:

C(i,j) = The j^{th} futures contract month for month *i*

Define:

M[C(i,j-1)] = The calendar month of the $(j\text{-}1)^{th}$ contract for month *i,*

M[C(i,j)] = The calendar month of the j^{th} contract for month *i*, and

$$Interval\ D = \mathrm{M[C(i,j)] - M[C(i,j-1)]}$$

Thus, the selected forward curve, for month *i*, can be viewed as a series of eligible futures contract prices:

C(i,1), C(i,2), C(i,3), … up to *C(i,j)*, where j is the number of eligible contracts in month *i*.

Calculate the implied roll yield of each consecutive pair of contracts on the selected forward curve. The implied roll yield of the consecutive contracts C(*i,j-1*) and C(*i,j*) is computed as follows:

$$Implied\ Roll\ Yield\_C(i,j) = \left[\frac{C(i,j-1) - C(i,j)}{C(i,j) * Interval\ D}\right]$$

Rank the Contract Months from best to worst, based on their implied roll yields. The Contract Months are ranked based on their implied roll yields, with the best candidate for the new Rolled-in Contract Month having the largest implied roll yield, and the next best candidate having the second largest implied roll yield, and so on:

Best(1) = C(i,f),

where:

*Implied roll yield*_C(*i,f*) = Largest{*Implied roll yield_C(i,j*), j=1, …, number of eligible contracts in month *i*},

Best(2) = C(i,g),

where:

*Implied roll yield*_C(*i,g*) = Second largest (*Implied roll yield_C*(*i,j*), j=1, …, number of eligible contracts in month *i*}

and so on.

Create the Optimum Set of Contract Months based on the Rank Order of the Commodity. Select the first k contract months based on their rankings, where k is the Rank Order of the given commodity and create the optimum set of contracts for that commodity.

{Best(1), Best(2), … , Best(*k*)}

Apply the Dynamic Roll Parity Principle. For a given commodity, if the rolled-out contract is included in the optimum set of contract months, continue to use the same contract month as the rolled-in contract for the current month; otherwise, choose the first ranked contract month in the optimum set of contract months to be the new rolled-in contract for the current month.

Monthly Dynamic Roll Schedule

Assemble the New Rolled-in Contract Months. S&P Dow Jones Indices creates a monthly dynamic roll schedule of the S&P GSCI DR by assembling all the new rolled-in contract months for all the S&P GSCI commodities. This set of contract months is effective for the upcoming monthly roll period, from the fifth (5^{th}) business day to the ninth (9^{th}) business day.

The Rank Orders of the S&P GSCI Commodities. As applied in the calculation of the S&P GSCI Dynamic Roll, the rank orders of the S&P GSCI commodities are given as follows:

Commodity	Code	Rank Order
Chicago Wheat	W	2
Kansas Wheat	KW	2
Corn	C	1
Soybeans	S	1
Coffee	KC	1
Sugar	SB	1
Cocoa	CC	1
Cotton	CT	1
Lean Hogs	LH	1
Live Cattle	LC	1
Feeder Cattle	FC	1
WTI Crude Oil	CL	3
Heating Oil	HO	2
RBOB Gasoline	RB	2
Brent Crude Oil	LCO	2
Gas Oil	LGO	3
Natural Gas	NG	1
Aluminum	MAL	2
Copper	MCU	3
Nickel	MNI	2
Lead	MPB	1
Zinc	MZN	2
Gold	GC	1
Silver	SI	2

Rank Order descriptions are as follows:

- Rank Order of 1 – Use the DRA(1) Algorithm, with the Optimum Set of Contracts consisting of only the top ranked contract
- Rank Order of 2 – Use the DRA(2) Algorithm, with the Optimum Set of Contracts consisting of the top two ranked contracts
- Rank Order of 3 – Use the DRA(3) Algorithm, with the Optimum Set of Contracts consisting of the top three ranked contracts
- Rank Order of 4 – Use the DRA(4) Algorithm, with the Optimum Set of Contracts consisting of the top four ranked contracts

For example, Corn has a Rank Order of 1. If the rolled-out contract for corn is not the same as the top ranked contract, use the top-ranked contract in the optimum set of contracts as the new rolled-In contract month. Otherwise, if the rolled-out contract month is the same as the top ranked contract, then the same rolled-out contract month will continue to be used as the new rolled-in contract month.

In the case of Crude Oil, which has a Rank Order of 3, this means if the rolled-out contract is not one of the top three contract months in the optimum set of contracts for Crude Oil, the top ranked contract month is selected as the new rolled-in contract month. Otherwise, if the rolled-out contract is among the top three contract months in the optimum set of contracts, then the same rolled-Out contract month will continue to be used as the new rolled-in contract month.

The Rank Orders are reviewed annually to determine if changes are required.

For the list of the eligible futures contract months for the S&P GSCI Dynamic Roll for the current year, please refer to the Dynamic Roll Eligible Contract Month Table available at www.spglobal.com/spdji/.

Index Maintenance

Annual Contract Eligibility Review

The eligible contract months are reviewed annually based on liquidity rules following the S&P GSCI. For the S&P GSCI Dynamic Roll, a contract must have a Monthly Dollar Value Traded (MDVT) of at least U.S. $1.2 billion to be included as an eligible contract for the calendar month, and a Monthly Dollar Value Traded (MDVT) of at least U.S. $0.4 billion to remain eligible for the calendar month.

In addition to the MDVT requirement, a contract must meet the same requirement on Monthly Dollar Open Interest (MDOI). The annual calculation period is defined as the 12-month period ending on August 31st of the calendar year immediately prior to the year for which the eligible contracts are being determined. If a contract is eligible for inclusion in a particular calendar month, it stays eligible for the subsequent calendar months until its expiry. There is no restriction on the number of eligible contracts included in each calendar month.

Monthly Dollar Value Traded Calculation

$$MDVT_i = \sum_{t=1}^{n} (V_t * DCRP_t) * CS$$

where:

$MDVT_i$ = Monthly Dollar Value Traded of contract *i*

V_t = Volume on day *t*

$DCRP_t$ = Daily Contract Reference Price on day *t*

n = Number of business days in the calendar month

CS = Contract Size

Monthly Dollar Open Interest Calculation

$$MDOI_i = \frac{1}{n} \sum_{t=1}^{n} (OI_t * DCRP_t) * CS$$

where:

$MDOI_i$ = Monthly Dollar Open Interest of contract *i*

OI_t = Open Interest on day *t*

$DCRP_t$ = Daily Contract Reference Price on day *t*

n = Number of business days in the calendar month

CS = Contract Size

Index Calculation

Overview of the Calculation Process

The calculation of the S&P GSCI Dynamic Roll considers price levels of the current roll out contract month on each commodity and, during the Roll Periods, price levels of the Roll Contract Expirations as well. Once the Roll Period has been completed, the Roll Contract Expiration becomes the First Nearby Contract Expiration. The index families are calculated daily throughout the calendar year. The indices follow the NYSE holiday schedule.

The Excess Return index represents the return of a portfolio of commodity futures contracts, the composition of which reflects the CPWs of all Designated Contracts and the contract roll weights of all futures contract months. The index is, therefore, calculated based on the Contract Daily Return.

The Total Return index reflects the performance of a total return investment in commodities — Contract Daily Return plus the daily interest on the funds hypothetically committed to the investment.

For information on the calculation of the spot, ER & TR index levels, please refer to the Production Weighted Indices and Other Derived Indices sections of the S&P Dow Jones Indices' Commodity Index Mathematics Methodology.

Currency of Calculation and Additional Index Return Series

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

For information on index calculation, please refer to the Other Derived Indices section of the S&P Dow Jones Indices' Commodity 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/.

Index Governance

Index Committee

An S&P Dow Jones Indices Index Committee maintains the index. The Index Committee meets regularly. At each meeting, the Index Committee reviews any significant market events. In addition, the Index Committee may revise index policy for timing of rebalancings 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' Commodities Indices Policies & Practices document.

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 Code	Index Name	Launch Date	BBG - Real Time	BBG	RIC	Base Date	Base Value
SPDYCI	S&P GSCI Dynamic Roll	01/26/2011	SPGSCI	SPGCCI	.SPGSCI	01/16/1995	100
SPDYAG	S&P GSCI Agriculture Dynamic Roll	02/17/2011				01/16/1995	100
SPDYEN	S&P GSCI Energy Dynamic Roll	02/17/2011				01/16/1995	100
SPDYIN	S&P GSCI Industrial Metals Dynamic Roll	02/17/2011				01/16/1995	100
SPDYLV	S&P GSCI Livestock Dynamic Roll	02/17/2011				01/16/1995	100
SPDYPM	S&P GSCI Precious Metals Dynamic Roll	02/17/2011				01/16/1995	100
SPDYLE	S&P GSCI Light Energy Dynamic Roll	04/15/2011				01/16/1995	100
SPDYSE	S&P GSCI Dynamic Roll Select	08/07/2012				01/16/1995	100
SGD12P	S&P GSCI Dynamic Roll 12 Month Petroleum	04/28/2015		SGD12P	.SGD12P	01/16/1995	100

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 A

Calculation of Additional S&P GSCI Dynamic Roll Indices

S&P GSCI Dynamic Roll Select Index

The S&P GSCI Dynamic Roll Select reflects the total return available through an unleveraged investment in the S&P GSCI Dynamic Roll; however, rather than using the 24 commodities from the S&P GSCI, only the select 14 commodities of the S&P GSCI Equal Weight Select are included in the Index.

Methodology Overview. During the January roll period at the beginning of each calendar year, the S&P GSCI Dynamic Roll Select includes only the same select commodities as the S&P GSCI Equal Weight Select. The select commodities are weighted based on the same Contract Production Weights (CPWs) as the commodities in S&P GSCI Dynamic Roll. The CPWs are updated annually and instituted during the January roll period. The periodic rolling process of the individual commodities follows the methodology specified by the S&P GSCI Dynamic Roll. Announcements of the new futures contract months to be rolled into are made following the close of business on the second business day of each month.

The S&P GSCI Equal Weight Select. The S&P GSCI Equal Weight Select sorts the S&P GSCI commodity space into six commodity groups and selectively includes only the largest and most liquid commodities in each commodity group.

The S&P GSCI Equal Weight Select is comprised of 14 commodities, categorized into six commodity groups, where:

- No single group accounts for more than 30 % of the total.
- Rules-based annual reconstitution.
- Turnover minimized through an annual rebalancing.
- Fewer commodities than the S&P GSCI which results in fewer monthly rolls.

For more information on the S&P GSCI Equal Weight Select please refer to the S&P GSCI Capped Indices Methodology.

S&P GSCI Dynamic Roll Alpha Light Energy

The S&P GSCI Dynamic Roll Alpha Light Energy index measures a long position in the S&P GSCI Dynamic Roll Light Energy ER index and a short position in the S&P GSCI Light Energy ER index (the benchmark index), on a market neutral basis.

The Index aims to measure the effects of the different roll strategies between the S&P GSCI Dynamic Roll Light Energy index and the S&P GSCI Light Energy index while neutralizing the market directional bias.

Long-Short Index. The index value is determined by measuring the difference between a long position in the S&P GSCI Dynamic Roll Light Energy ER index and a short position in the S&P GSCI Light Energy ER index.

Calculation. On each Index Level Determination Date, t, a reference index level is determined by the following formula:

$$Ref_t = Ref_{t_r} * \left[1 + \left(\frac{Enhanced_{\ t}}{Enhanced_{\ t_r}} - \frac{Bench_{\ t}}{Bench_{\ t_r}}\right)\right]$$

where:

Ref_t = the Long-Short reference index level on date t

$Enhanced_t$ = the S&P GSCI Dynamic Roll Light Energy ER index on date t

$Bench_t$ = the S&P GSCI Light Energy ER index on date t

tr = the last Rebalancing Day preceding the date t (The rebalancing dates are the 9th S&P GSCI day of each month)

Market Neutral Exposure. The final index value is determined by measuring the daily return of the Long-Short Index adjusted by the return of a target exposure weighted benchmark index.

Market Neutral Exposure Calculation. On each Index Level Determination Date t, the index exposure to the benchmark index is determined by the following formulae:

$$Exposure_{\ t} = TargetExposure_{\ t-2}$$

$$TargetExposure_{\ t} = -\frac{RefVolatility_{\ t}}{BenchVolatility_{\ t}} * Correl_{\ t}$$

where:

$TargetExposure_t$ = the exposure multiplier for the benchmark index

$RefVolatility_t$ = the 120-day volatility of the reference index (of the daily natural log (ln) return)

$BenchVolatility_t$ = the 120-day volatility of the benchmark index (of the daily ln-return)

$Correl_t$ = the 120-day correlation of the reference and benchmark indices (of the daily ln-return)

Index Calculation. On each Index Level Determination Date t, the index level is determined by the following formula:

$$Index_{\ t} = Index_{\ t-1} * \left[\frac{Ref_{\ t}}{Ref_{t-1}} + Exposure_{\ t-1} * \left(\frac{Bench_t}{Bench_{\ t-1}} - 1\right)\right]$$

where:

$Index_t$ = the index level on Index Level Determination Date t

S&P GSCI Dynamic Roll 12-Month Petroleum Index

The index measures the performance of the constituents of the S&P GSCI Dynamic Roll Index within the petroleum sector and with eligible contracts expiring in 12 months or less.

Index Eligibility. The index is comprised of commodities in the petroleum sector, specifically WTI Crude Oil (CL), Brent Crude Oil (LCO), RBOB Gasoline (RB), Gas Oil (LGO) and Heating Oil (HO). It uses the same selection criteria as the S&P GSCI Dynamic Roll Index with the exception that no single contract can be more than 12 months out in the future chain during monthly selections.

Index Maintenance. All index adjustments follow the S&P GSCI Dynamic Roll Index.

Rebalancing. The index utilizes the same CPWs as the S&P GSCI Dynamic Roll Index. New constituent contract months are selected monthly on the third business day and implemented after the close of the fifth business day with the same roll schedule as the underlying index. The Dynamic Roll Matrices, provided below, are reviewed annually along with the underlying index.

For the list of the eligible futures contract months for the S&P GSCI Dynamic Roll 12 Month Petroleum for the current year, please refer to the Dynamic Roll Eligible Contract Month Table available at www.spglobal.com/spdji/.

Appendix B

Glossary

DRA(k) Algorithm. The DRA(k) Algorithm is the k^{th} Dynamic Roll Algorithm, with *k* indicating the number of top-ranked futures contract months included in the Optimum Set of Contract Months for that algorithm. The values of *k* are from 1 through 4.

Dynamic Roll Matrix. The Dynamic Roll Matrix of a given commodity lists all the eligible futures contract months for that commodity, for each calendar month of the year. The eligible contract months are determined based on the liquidity profile measured by open interest and volume, which are verified annually.

Dynamic Roll Parity Principle. For a given commodity, if the Rolled-out Contract is included in the Optimum Set of Contract Months, continue to use the same contract month as the Rolled-in Contract for the current month; otherwise, choose the first ranked contract month in the Optimum Set of Contract Months to be the new Rolled-in Contract for the current month.

Optimum Set of Contract Months. For a given commodity, the Optimum Set of Contract Months is the set of top-ranked contract months determined by that commodity's Dynamic Roll Algorithm. The number of contract months included in the Optimum Set of Contract Months is governed by the Rank Order of the given commodity.

Rank Order. The Rank Order of a given commodity, denoted by *k*, refers to the choice of the DRA(k) algorithm for that commodity during the monthly Dynamic Roll Selection Process, detailed in the next chapter. The values of Rank Order are from 1 through 4.

Roll Determination Date. The Roll Determination Date is the third S&P GSCI Business Day of each month, two days prior to the start of the S&P GSCI Roll Period.

Appendix C

Methodology Changes

Methodology changes as of January 31, 2015, are as follows:

Change	Effective Date (After Close)	Methodology Previous	Methodology Updated
Annual Contract Eligbility Review	01/06/2017	Existing eligibility months are verified annually.	Liquidity rules added to make the eligibility rules-based. Reviewed in November for the annual January rebalance.

Appendix D

ESG Disclosures

EXPLANATION OF HOW ENVIRONMENTAL, SOCIAL & GOVERNANCE (ESG) FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY[2]		
1.	**Name of the benchmark administrator.**	S&P Dow Jones Indices LLC.
2.	**Underlying asset class of the ESG benchmark.**[3]	N/A
3.	**Name of the S&P Dow Jones Indices benchmark or family of benchmarks.**	[S&P DJI Futures 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

[2] 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].

[3] 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 by providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P DJI defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Information presented prior to an index's launch date is hypothetical back-tested performance, not actual performance, and is based on the index methodology in effect on the launch date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. In addition, forks have not been factored into the back-test data with respect to the S&P Cryptocurrency Indices. For the S&P Cryptocurrency Top 5 & 10 Equal Weight Indices, the custody element of the methodology was not considered; the back-test history is based on the index constituents that meet the custody element as of the Launch Date. Also, the treatment of corporate actions in back-tested performance may differ from treatment for live indices due to limitations in replicating index management decisions. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results.

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

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

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