S&P Dow Jones Indices

A Division of S&P Global

S&P GSCI Roll Weight Select

Methodology Supplement

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Introduction

Index Objective

The S&P GSCI® Roll Weight Select is designed to measure the largest and most liquid commodities weighted by the relative change in the realized roll yield for each commodity in the index. The index underweights (overweights) commodities with a smaller (larger) roll yield at the current month than at the 1-month forward expiration.

The S&P GSCI® Roll Weight Select Methodology Supplement

This supplement uses various terms from the S&P GSCI® Methodology. Where not specifically noted otherwise in this document, the rules of the S&P GSCI® will prevail. Where the terms in this document are also defined in the S&P GSCI® Methodology, the definitions in this document prevail.

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' GSCI Reference Guide	GSCI Reference Guide
S&P Dow Jones Indices' Index Mathematics Methodology	Index Mathematics Methodology

This supplement 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 supplement. Any changes to or deviations from this methodology supplement are made in the sole judgment and discretion of S&P Dow Jones Indices so that the index continues to achieve its objective.

For information on:

- *Quality Assurance*
- *Internal Reviews of Methodology*
- *Calculations and Pricing Disruptions*
- *Expert Judgment*
- *Data Hierarchy*
- *Unexpected Exchange Closures*

Please refer to S&P Dow Jones Indices' Commodities Indices Policies & Practices document.

Index Eligibility. Only the 14 commodities that are included in the S&P GSCI® Equal Weight Select are included in the S&P GSCI® Roll Weight Select. Please refer to the S&P GSCI® Equal Weight Select Methodology for details on the index eligibility process. The reconstitution occurs annually.

Weighting Scheme. On the determination date, each of the 14 commodities is weighted according to its rank of relative change in realized roll yield. The commodity with the highest (lowest) change in realized roll yield, indicating the roll yield is less (more) in the current month than the 1 month forward contract, is given the lowest rank of 1 (highest rank of 14).

In the rank ordering, commodities with a value of 1, 2, 3 or 4 are assigned a preliminary relative weight of 2%. Commodities with a value of 5, 6, 7, 8, 9, 10, 11, or 12 are assigned a preliminary relative weight of 6%. Commodities with a value of 13 or 14 are assigned a preliminary relative weight of 8%. This leaves the preliminary weight total at 72%, so the final weights are normalized to equal 100% with respective weights of 2.8%, 8.3%, and 11.1%.

Please see the Calculation Appendix below for further information.

Capping. The rules detailed in the *S&P GSCI Capped Component Methodology Supplement* are implemented on a quarterly basis[1].

Weighting Frequency. Monthly.

Determination Date. The third S&P GSCI® Business Day**.**

Implementation. Weights are updated monthly and instituted during the S&P GSCI® monthly index roll period (5th to 9th business days).

Calculation Appendix

Determination of the gradient signal from each commodity
For each commodity "A", at each monthly node i (for i=0 and i=1), for a given month m, the following notation is adopted:

A_PL(0,m) = the index level of S&P GSCI® A, for month m, (as of the Determination Date specified)

A_PL(1,m) = the index level of S&P GSCI® A 1 Month Forward, for month m,

A_EL(0,m) = the index level of S&P GSCI® A ER, for month m,

A_EL(1,m) = the index level of S&P GSCI® A 1 Month Forward ER, for month m.

These four inputs, define the following variables

A_PR(i,m) = Price index return for commodity A, at node i, for month m

= (A_PL(i,m) – A_PL(i,m-1)) / A_PL(i,m-1),

A_ER(i,m) = Excess Return index return for commodity A, at node i, for month m

= (A_EL(i,m) – A_EL(i,m-1)) / A_EL(i,m-1).

The following relationship, for a given commodity A, at node i, for month m is defined as:

A_RRY(i,m) = Realized Roll Yield for commodity A, at node i, for month m,

= A_ER(i,m) – A_PR(i,m).

Thus, the realized roll yield A_RRY(i,m) is a proxy of the monthly roll yield for commodity A, incorporating the effects of the daily changes in the prices, as well as the effects of the rolling of the relevant contracts during the month, as specified in the S&P GSCI® methodology.

[1] 35/20 is a means of identifying a two-tiered capping model. It does not connote compliance with any regulatory regime or guideline (including, without limitation, the diversification requirements under Articles 52 and 53 of Directive 2009/65/EC, as amended or supplemented from time to time).

Interpolation of S&P GSCI® Realized Roll Yields

Any A commodity that does not roll monthly will require an interpolation of its realized roll yield.

The Interpolated Realized Roll Yield for each commodity A, is defined as follows:

A_IRRY(i,m) = A_ARRY(i,m) / A_IF(i,m),

Where,

A_ARRY(i,m) is the adjusted realized roll yield of A, for node i, for month m, and

A_IF(i,m) is the interpolation factor of A, for node i, for month m.

The realized roll yield is adjusted in the event that no rolling is involved by carrying over the previously calculated realized roll yield based on the commodities contract calendar. The interpolation factor is a count of consecutive months for an individual commodity. The interpolation is achieved by dividing the adjusted realized roll yield by its respective interpolation factor.

We now define the following relationship, for a given commodity A, at node i, for month m:

A_GD(i+1,m) = gradient for commodity A, at node (i+1), for month m,

= A_IRRY(i+1,m) – A_IRRY(i,m).

The gradient A_GD(1,m) is a measure of the change in the interpolated realized roll yields for commodity A, at node 1 and node 0, respectively, for a given month m. Additionally, if commodity A is in a state of contango, i.e., if A_RRY(0,m) and the gradient are both negative, then the sign of the gradient is reversed. The gradient is also reversed if commodity A is in a state of backwardation, i.e., if A_RRY(0,m) and the gradient are both positive. The sign reversal is implemented to so that commodities in backwardation are preferred to those in contango, other things being equal, in cases where the forward curve deviates from normal patterns.

For roll schedules please see the S&P GSCI® methodology.

Example. This section illustrates the interpolation process, using Sugar as an example, for the S&P GSCI® Sugar 1 Month Forward. See Table 1 below.

For January, the realized roll yield for Sugar is shown in column 4 (RRY=0.0187). Based on Sugar's roll schedule, it was long the same contract in the following month (the May contract, K), its unadjusted realized roll yield for February is equal to 0, as a result of no rolling of contracts. The unadjusted realized roll yield for February is then superseded by January's realized roll yield. For January and February, the interpolated realized roll yield is obtained by dividing the adjusted realized roll yield by the interpolation factor for the given month. Thus, the interpolation factor of 2 for January and February is applied, spreading the unadjusted realized roll yield over the 2-month period. The interpolation factor is a function of how many months the same futures contracts are in force. Thus, for March and April, the interpolation factor is again 2 because the July contract (N) is in use. Likewise, the unadjusted realized roll yield for April is filled in with the realized roll yield for March. However, for May through July, the October contract (V) is in use for the three months. When the realized roll yield for sugar is calculated, it is spread over the three month time period. In the case of August until December, the upcoming March (H) Contract has an interpolation factor set at 5.

Table 1: Example of Sugar (SB) S&P GSCI® Sugar 1 Month Forward					
Col.1 Month	Col.2 Interpolation Factor	Col.3 Contract Month	Col.4 RRY	Col.5 Adjusted	Col.6 Interpolated RRY
Jan	2	K	0.0187	0.0187	0.0093
Feb	2	K	0.0000	0.0187	0.0093
Mar	2	N	0.0375	0.0375	0.0187
Apr	2	N	0.0000	0.0375	0.0187
May	3	V	-0.0176	-0.0176	-0.0059
Jun	3	V	0.0000	-0.0176	-0.0059
Jul	3	V	0.0000	-0.0176	-0.0059
Aug	5	H	-0.0210	-0.0210	-0.0042
Sep	5	H	0.0000	-0.0210	-0.0042
Oct	5	H	0.0000	-0.0210	-0.0042
Nov	5	H	0.0000	-0.0210	-0.0042
Dec	5	H	0.0000	-0.0210	-0.0042

S&P GSCI® Energy & Metals Roll Weight Select Capped Component. The S&P GSCI Energy & Metals Roll Weight Select Capped Component manages the roll yield by modifying the weights according to the relative change in the realized roll yield for each of the commodities in the S&P GSCI energy and metals sectors.

Index Eligibility. The nine energy and metals commodities that are included in the S&P GSCI Roll Weight Select are included in the S&P GSCI® Energy & Metals Roll Weight Select Capped Component. The reconstitution occurs annually.

Capping Frequency. Quarterly; the capping process is performed according to the following rules, in succession:

1. Only one component can reach a maximum weight of 35%. Any excess weight is distributed proportionately among the remaining components.
2. No remaining component's weight can exceed 20%. Any excess weight is distributed proportionately among the remaining components.

Determination Date. One S&P GSCI Business Day before the first quarterly roll date (January, April, July and October).

Components: The four commodities below are treated as one component based on their similarity:

• **Petroleum:** WTI Crude Oil, Brent Crude Oil, Gasoil, and Unleaded Gasoline

Currency, Currency Hedged, and Risk Control Indices

Additional currency, currency hedged, and risk control versions of the indices may be available. For a list of available currency, currency hedged, and risk control indices, please contact Client Services at index_services@spglobal.com.

For more information on currency, currency hedged, and risk control indices, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.

Tickers

The table below lists headline indices covered by this document. All currency, currency hedged, risk control, and return type versions of the below indices that may exist are also covered by this document. Please contact index_services@spglobal.com for a complete list of indices covered by this document.

Index	Bloomberg
S&P GSCI® Roll Weight Select	SPGSRWS
S&P GSCI® Roll Weight Select ER	SPGSRWSP
S&P GSCI® Roll Weight Select TR	SPGSRWST
S&P GSCI® Energy & Metals Roll Weight Select Capped Component	SGEMRWC
S&P GSCI® Energy & Metals Roll Weight Select Capped Component ER	SGEMRWCP
S&P GSCI® Energy & Metals Roll Weight Select Capped Component TR	SGEMRWCT

S&P Dow Jones Indices' Contact Information

Contact Information

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

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