

GUIDELINE

Solactive Commodity Composite Index

Version 2.0 dated July 9, 2019



Contents

Introduction

1 Index specifications

- 1.1 Short name and ISIN
- 1.2 Initial value
- 1.3 Distribution
- 1.4 Prices and calculation frequency
- 1.5 Weighting
- 1.6 Decision-making bodies
- 1.7 Publication
- 1.8 Historical data
- 1.9 Licensing

2 Composition of the Index

- 2.1 Selection of the index components
- 2.2 Ordinary adjustment
- 2.3 Extraordinary adjustment

3 Calculation of the Index

- 3.1 Index formula
- 3.2 Precision
- 3.3 Adjustments
- 3.4 Dividends and other distributions
- 3.5 Corporate actions
- 3.6 Recalculation
- 3.7 Market Disruption

4 Definitions

5 Appendix

- 5.1 Contact data
- 5.2 Calculation of the Index – change in calculation method
- 5.3 Disclaimers

This document contains the underlying principles and regulations regarding the structure and the operating of the Solactive Commodity Composite Index ("the Index"). Solactive AG shall make every effort to implement regulations. Solactive AG does not offer any explicit or tacit guarantee or assurance, neither pertaining to the results from the use of the Indices nor the Index values at any certain point in time nor in any other respect. The Indices are merely calculated and published by Solactive AG and it strives to the best of its ability to ensure the correctness of the calculation. There is no obligation for Solactive AG – irrespective of possible obligations to issuers – to advise third parties, including investors and/or financial intermediaries, of any errors in the Index. The publication of the Index by Solactive AG is no recommendation for capital investment and does not contain any assurance or opinion of Solactive AG regarding a possible investment in a financial instrument based on these Indices.

Introduction

This document is to be used as a guideline with regard to the composition, calculation and management of the Solactive Commodity Composite Index. Any changes made to the guideline are initiated by the Committee specified in section 1.6 of this document. The Index is calculated and published by Solactive AG. The name “Solactive” is copyrighted.

1 Index specifications

The Solactive Commodity Composite Index is calculated and distributed by Solactive AG.

The Index is an index of sub-indices. The Index is designed to represent the collective performance of a wide range of commodities by providing an investible benchmark consisting of selected indices from leading global index sponsors and proprietary index providers. The Index consists of four equally-weighted commodities indices. In order to ensure counterparty diversification, the Index includes sub-indices accessed via a minimum of three counterparties.

The Index is calculated and published in USD.

1.1 Short name and ISIN

The Indices are distributed under the following identifiers:

Name	ISIN	WKN	Characteristic	RIC	BBG
Solactive Commodity Composite Index	DE000SLA5L21	SLA5L2	Index of indices	.SOLCOMCO	SOLCOMCO Index

1.2 Initial value

The Indices are launched with a level of 100.0000 at the close on the start date, 21st March 2018. Data before 21st March is backtested.

1.3 Distribution

The Index is published via the price marketing services of Boerse Stuttgart AG and are distributed to all affiliated vendors. Each vendor decides on an individual basis as to whether he will distribute/display the Solactive Commodity Composite Index via his information systems.

1.4 Prices and calculation frequency

The level of the Index is calculated and published on each Calculation Day. The calculation schedule depends on the availability of the sub-indices and is agreed upon after the new selection is done for the upcoming year.

The Solactive Commodity Composite Index is calculated every Calculation Day at 11:00 pm CET. In case one of the sub-indices is not published on such a Calculation Day, the last available published price of such a sub-index is used for the calculation.

1.5 Weighting

The new index components are determined annually on the Selection Date. This is the first Business Day in December each year. The new index components as determined on the Selection Date will enter the index on the Major Rebalancing Date in June.

The selected index components are equally weighted. The determination of the selected index components is described in Section 2.1.

In addition to the Major Rebalancing Date in June, there are three Minor Rebalancing Dates (3rd Wednesday in March, September and December), on which the current index components get reweighted to an equal weighted allocation. The weights of the selected index components will be allowed to drift intra-quarter.

1.6 Decision-making bodies

A Committee composed of staff from Solactive is responsible any amendments to the rules (in this document referred to as the "Index Committee").

1.7 Publication

All specifications and information relevant for calculating the Index are made available on the <http://www.solactive.de> web page and sub-pages.

1.8 Historical data

Historical data will be maintained from the launch of the Index on 21st March 2018.

1.9 Licensing

Licences to use the Index as the underlying for investment products issued by stock exchanges, banks, financial services providers and investment houses or for benchmark usage are granted by Solactive AG.

2 Composition of the Index

2.1 Selection of the Index Components for annual review

The eligible universe is composed of the following indices (each of them an Underlying Component, together the Underlying Components):

Underlying Component	Provider	Name
1	Barclays	BCI Momentum Alpha
2	Barclays	BCI Roll Yield
3	Barclays	BCI Multi-Strategy
4	Barclays	BCOM Momentum Alpha
5	Barclays	BCOM Multi-Strategy
6	Barclays	BCOM Multi-Strategy II
7	Barclays	Backwardation Diversified
8	Citi	Citi CUBES (BCOM wtd) TR
9	Citi	Citi CUBES Distributed (BCOM wtd) TR
10	Citi	Citi Commodities Curve Composite Beta (BCOM wtd) TR
11	Citi	Citi Commodities BCOM Pre-Roll TR
12	Citi	Citi Commodities Dynamic Pre-Roll Beta TR
13	Credit Suisse	CSCB UCITS
14	Credit Suisse	CS Custom 24E
15	Credit Suisse	CS Seasonal Optimizer
16	Deutsche Bank	DBLCI OY Balanced
17	Deutsche Bank	DB Booster BCOM

18	Deutsche Bank	DB Booster S&P GSCI Light Energy
19	Goldman Sachs	Enhanced Strategy on the BCOM
20	Goldman Sachs	Backseeker II Strategy on the BCOM
21	Goldman Sachs	COT Congestion on the BCOM
22	Goldman Sachs	SAGE on the BCOM
23	JP Morgan	JPMCCI Ex Front Month Energy Light TR Index
24	JP Morgan	JPMCCI Energy Light TR Index
25	JP Morgan	JPMorgan Alternative Benchmark Enhanced Beta Select TR Index
26	JP Morgan	JPMorgan Commodity Carry Pairs Beta Index
27	JP Morgan	JPMorgan Dynamic Roll Timing Alternative Benchmark Index
28	JP Morgan	JP Morgan Backwardation Alternative Benchmark
29	Morgan Stanley	BCOM Pre-roll
30	Morgan Stanley	BCOM Forward 3 Months Pre-roll
31	Morgan Stanley	BCOM Dynamic Roll
32	Morgan Stanley	BCOM Dynamic / Momentum Roll
33	Morgan Stanley	MS Diversified Back Basket Pre F3 Roll
34	Morgan Stanley	MS Diversified Back Basket Dynamic Roll
35	Morgan Stanley	MS RADAR (BCOM sector)
36	Morgan Stanley	MS RADAR
37	Morgan Stanley	MS TOPS S8 Early Roll

38	Morgan Stanley	MS TOPS S8 Curve Momentum
39	UBS	UBS Bloomberg CMCI

The eligible universe may be reviewed from time to time due to the following reasons (not exhaustive):

- Changes in the market environment
- Availability of performance history
- UCITS status
- Structure of the sub-index and its coverage of investable range of commodities
- Solactive is able to receive and consume the relevant sub-index levels.

Changes to the eligible universe must be approved by an index committee.

Based on the eligible universe as defined above, the following selection steps are performed in order to determine the selected index components:

1. Remove any indices from the universe for whom the provider of the associated swap has a short-term credit rating below A2 (S&P) or below P2 (Moody's).
2. Score each index in the universe separately for each of the criteria described in the following table, then combine the scores using weightings shown. The performance and volatility values should be calculated on a total return USD basis, with the end of period for all calculations (including "History") being the last business day of the October preceding the review.

If less than 5 years of performance history exists for an index, the Score for the 5Y Performance metric allocated to that index should be 0, and the Volatility and Return / Risk calculation should be based on 3 year data.

If less than 3 years of performance history exists for an index, the Score for the 3Y Performance metric allocated to that index should be 0, and the Volatility and Return / Risk calculation should be based on 1 year data.

If less than 1 year of performance history exists for an index, that index should be excluded from the universe for this review.

Metric	Unit	Score						Weighting
		0	1	2	3	4	5	
1Y Performance	%ile							12.0%
3Y Performance								10.0%
5Y Performance		<20	<40	<55	<65	<85	>85	18.0%
5Y Volatility								20.0%
5Y Return / Risk								20.0%
History	months	<18	<24	<36	<48	<60	>60	20.0%

3. Rank the indices according to the scores given
4. Calculate a matrix of correlations between the 5-year daily USD performance of every index in the universe and every other index in the universe.

5. Add the highest ranked of the incumbent indices (i.e. those that are already a constituent of the composite index) to a provisional composite index list.
6. Looking at each of the incumbent indices not yet added to the provisional composite index list, starting from the highest ranked according to the scores given in step 2, perform the following:
 - If the provisional composite list already contains 2 indices from the same provider, check whether the provider of the index under inspection is already in the provisional composite list. If it is, ignore this index and move on to the next incumbent index in the ranking.
 - Inspect the calculated correlation between this index (index A) and each of those already added to the provisional composite index list (index B).
 - For each such correlation value, check whether the figure is above the 90th percentile of all correlation values against index B.
 - If *none* of the inspected values are above the 90th percentile, add index A to the provisional composite index list.
 - Continue this process until either:
 - The provisional composite index list contains 3 indices.
 - All incumbent indices have been inspected.
7. If the provisional composite list contains fewer than 3 indices perform the following: Using the list of incumbent indices not yet added to the provisional composite list, starting with the highest ranked (by step 2 scores), add each index to the provisional composite list until it contains a total of 3 indices.
8. Looking at each of the indices not yet added to the provisional composite list (including non-incumbent indices this time), starting from the highest ranked according to the scores given in step 2, perform the following:
 - If the provisional composite list already contains 2 indices from the same provider, check whether the provider of the index under inspection is already in the provisional composite list. If it is, ignore this index and move on to the next index in the ranking.
 - Inspect the calculated correlation between this index (index A) and each of those already added to the provisional composite index list (index B).
 - For each such correlation value, check whether the figure is above the 90th percentile of all correlation values against index B.
 - If *none* of the inspected values are above the 90th percentile, add index A to the provisional composite index list.
 - Continue this process until either:
 - The provisional composite index list contains 4 indices.
 - All indices have been inspected.
9. If the provisional composite list contains fewer than 4 indices perform the following: Using the list of all indices not yet added to the provisional composite list, starting with the highest ranked (by step 2 scores), add each index to the provisional composite list until it contains a total of 4 indices.
10. The 4 indices in the provisional composite list will be proposed as the new set of indices for the composite

Once the four sub-indices are identified they are allocated an equal weight of 25%.

The formula to calculate the necessary statistics is provided below. For that purpose, the prices of generic sub-indices i and j on Calculation Day t are denoted as $P_{i,t}$ and $P_{j,t}$

Define the daily return of sub-index i on Calculation Day t as

$$r_{i,t} = \frac{P_{i,t}}{P_{i,t-1}} - 1$$

and analogously the daily return of sub-index j on Calculation Day t as

$$r_{j,t} = \frac{P_{j,t}}{P_{j,t-1}} - 1$$

Define the n-year performance (for n = 1,...,5) of sub-index i calculated on index Selection data date (as defined in section 4) t_s as:

$$Perf_{i,t_s}^n = \frac{P_{i,t_s}}{P_{i,t_s-n \text{ years}}} - 1$$

Where $P_{i,t_s-n \text{ years}}$ is the closing price of sub-index i n years prior to index Selection data date t_s . For the avoidance of doubt, if the day n years prior to index selection data day t_s is not a Calculation Day, then the closing price of sub-index i on the immediately preceding Calculation Day shall be used. Assuming that in December 2017, the index selection date was 11th December, then $Perf_{i,t_s}^1$ would have used the closing price as of 9th December 2016 in the denominator (as 11th December 2016 was a Sunday).

Define the 5-year (annualized) volatility of sub-index i as:

$$vol_{i,t_s}^{5y} = \sqrt{252} * \sqrt{\frac{1}{\#obs(t_s, t_s - 5 \text{ years}) - 1} * \sum_{k=0}^{t_s-5 \text{ years}} (r_{i,t_s-k} - \overline{r_{i,t_s}^{t_s-5 \text{ years}}})^2}$$

Where $\overline{r_{i,t_s}^{t_s-5 \text{ years}}}$ denotes the mean of returns during the time period from index selection date t_s up to and including Calculation Day $t_s - 5 \text{ years}$.

$\#obs(t_s, t_s - 5 \text{ years})$ denotes the number of observations (= Calculation Days) in the time period from index selection date t_s up to and including Calculation Day $t_s - 5 \text{ years}$.

The correlation of the 5-year daily USD performance of sub-index i with sub-index j on index selection day t is calculated according to the following formula:

$$corr_{i,j,t_s}^{5y} = \frac{\sum_{k=0}^{t_s-5 \text{ years}} (r_{i,t_s-k} - \overline{r_{i,t_s}^{t_s-5 \text{ years}}}) * (r_{j,t_s-k} - \overline{r_{j,t_s}^{t_s-5 \text{ years}}})}{\sqrt{\sum_{k=0}^{t_s-5 \text{ years}} (r_{i,t_s-k} - \overline{r_{i,t_s}^{t_s-5 \text{ years}}})^2 * \sum_{k=0}^{t_s-5 \text{ years}} (r_{j,t_s-k} - \overline{r_{j,t_s}^{t_s-5 \text{ years}}})^2}}$$

2.2 Ordinary adjustment

The index is rebalanced to the newly selected index components close of business on the third Wednesday in June. The index components get re-weighted to an equal-weighted allocation close of business on the third Wednesday in March, September and December.

2.3 Extraordinary adjustment

An extraordinary adjustment to the index only occurs if one of the selected index components ceases to exist (e.g. due to a merger of the respective sub-index) or is no longer UCITS compliant.

3 Calculation of the Index

3.1 Index formula

The level of the index on any Calculation Day t is determined according to the following formula:

$$Index_t = \sum_{i=1}^n P_{i,t} * NOSH_{i,t_R}$$

Where n is the number of selected index components, $P_{i,t}$ is the closing price of sub-index i on Calculation Day t (if the closing price of sub-index i on calculation day t is not published, then the closing price as of the immediately preceding Calculation Day is used) and $NOSH_{i,t_R}$ is the number of shares of sub-index i as determined on index rebalancing Day t_R . For the avoidance of doubt, if Calculation Day t is itself a rebalancing day, then the number of shares as determined on the rebalancing day immediately preceding Calculation Day t shall be used in the calculation of the index level on Calculation Day t .

The number of shares of sub-index i as determined on index rebalancing Day t_R is determined according to the following formula:

$$NOSH_{i,t_R} = \frac{w_{i,t_S} * Index_{t_R}}{P_{i,t_R}}$$

Where w_{i,t_S} is the weight of sub-index i as determined on the relevant index selection day t_S .

3.2 Precision

The Index Level will be published with rounding to [4] decimal places.

3.3 Adjustments

Not applicable.

3.4 Dividends and other distributions

Not applicable.

3.5 Corporate actions

Not applicable.

3.6 Recalculation

Solactive AG makes the greatest possible efforts to accurately calculate and maintain its indices. However, the occurrence of errors in the index determination process cannot be ruled out. In such cases Solactive AG strictly adheres to its publicly available [Correction Policy](#).

3.7 Market Disruption

In periods of market stress Solactive AG calculates its indices following predefined and exhaustive arrangements set out in its publicly available [Disruption Policy](#).

4 Definitions

“Underlying Components” are the components listed in Section 2.1, comprising the eligible universe.

A **“Calculation Day”** is any weekday except Saturday and Sunday.

A **“Publication Day”** is any Publication Day except Christmas (25th December), New Year’s Day (1st January) and Good Friday (the Friday immediately preceding Easter Day)

The **“Index Calculator”** is Solactive AG or any other appropriately appointed successor in this function.

The **“Index Currency”** is USD.

A **“Major Rebalancing Day”** is the third Wednesday in June.

A **“Minor Rebalancing Day”** is the third Wednesday in March, September and December.

The **“Selection Day”** is the first Business Day in December each year.

The **“Selection Data Day”** is the last business day in October.

5 Appendix

5.1 Contact data

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5.2 Calculation of the Index – change in calculation method

The application by the Index Calculator of the method described in this document is final and binding. The Index Calculator shall apply the method described above for the composition and calculation of the Index Series. However, it cannot be excluded that the market environment, supervisory, legal, financial or tax reasons may require changes to be made to this method. The Index Calculator may also make changes to the terms and conditions of the Indices and the method applied to calculate the Indices, which he deems to be necessary and desirable in order to prevent obvious or demonstrable error or to remedy, correct or supplement incorrect terms and conditions. The Index Calculator is not obliged to provide information on any such modifications or changes. Despite the modifications and changes the Index Calculator will take the appropriate steps to ensure a calculation method is applied that is consistent with the method described above.

5.3 Disclaimers

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