SOLACTIVE
German Index Engineering

INDEX GUIDELINE

SOLACTIVE UNITED STATES 500 & GOLD TARGET VOLATILITY EUR INDEX

Version 1.0

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INTRODUCTION

This document (the "**GUIDELINE**") is to be used as a guideline with regard to the composition, calculation and maintenance of Solactive United States 500 & Gold Target Volatility EUR Index (the "**INDEX**"). Any amendments to the rules made to the Guideline are approved by the Oversight Committee specified in Section 5.5. The Index is owned calculated, administered and published by Solactive AG ("**SOLACTIVE**") assuming the role as administrator (the "**INDEX ADMINISTRATOR**") under the Regulation (EU) 2016/1011 (the "**BENCHMARK REGULATION**" or "**BMR**"). The name "Solactive" is trademarked.

The text uses defined terms which are formatted with "SMALL CAPS". Such Terms shall have the meaning assigned to them as specified in Section 6 (Definitions).

The GUIDELINE and the policies and methodology documents referenced herein contain the underlying principles and rules regarding the structure and operation of the INDEX. SOLACTIVE does not offer any explicit or tacit guarantee or assurance, neither pertaining to the results from the use of the INDEX nor the level of the INDEX at any certain point in time nor in any other respect. SOLACTIVE strives to the best of its ability to ensure the correctness of the calculation. There is no obligation for SOLACTIVE – 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 does not constitute a recommendation for capital investment and does not contain any assurance or opinion of SOLACTIVE regarding a possible investment in a financial instrument based on this INDEX.

1. INDEX SPECIFICATIONS

1.1. SCOPE OF THE INDEX

Category	Description
Asset Class	Mixed (Equity and Gold ETF exposure, dynamically weighted)
Strategy	Dynamic allocation between equity index and gold ETF, applying a volatility target mechanism daily.
Regional Allocation	Developed Markets (for equity component), and Gold exposure (global commodity ETF component).
Volatility Target	10.0%
Rebalancing Frequency	Daily

1.2. IDENTIFIERS AND PUBLICATION

The INDEX is published under the following identifiers:

Name	ISIN	Currency	Type	RIC	BBG ticker
Solactive United States 500 & Gold Target Volatility EUR Index	DE000SL0SBH9	EUR	ER*/VT*	.SOEGTVEU	SOEGTVEU Index

ER means that the UNDERLYING INDEX is calculated as Excess Return Index as described in the Equity Index Methodology, which is available on the SOLACTIVE website: https://www.solactive.com/documents/equity-index-methodology/ . VT means there is a volatility control formula used on top of the UNDERLYING INDEX. Please see section 3.1

The INDEX is published on the website of the INDEX ADMINISTRATOR (www.solactive.com) and is, in addition, available via the price marketing services of Boerse Stuttgart GmbH and may be distributed to all of its affiliated vendors. Each vendor decides on an individual basis as to whether it will distribute or display the INDEX via its information systems.

Any publication in relation to the INDEX (e.g. notices, amendments to the GUIDELINE) will be available at the website of the INDEX ADMINISTRATOR: https://www.solactive.com/news/announcements/.

1.3. INITIAL LEVEL OF THE INDEX

The initial level of the INDEX on the 2015-11-02 the START DATE, is 1000. Historical values from the 2025-12-01 the LIVE DATE, will be recorded in accordance with Article 8 of the BMR. Levels of the INDEX published for a period prior to the LIVE DATE have been back-tested.

1.4. PRICES AND CALCULATION FREQUENCY

The level of the INDEX is calculated on each CALCULATION DAY based on the availability of its components SOF5ESS0 Index, and PHAU LN Equity.

1.5. LICENSING

Licenses to use the INDEX as the underlying value for financial instruments, investment funds and financial contracts may be issued to stock exchanges, banks, financial services providers and investment houses by SOLACTIVE.

2. INDEX SELECTION

As this INDEX is based on a static basket, no selection takes place.

2.1. INDEX UNIVERSE REQUIREMENTS

Not applicable.

2.2. SELECTION OF THE INDEX COMPONENTS

The INDEX is composed of the following two underlying: an UNDERLYING INDEX and an ETF:

Name	Currency	RIC	BBG Ticker
Solactive Future Series 5-Day Roll United States 500 Excess Return USD Index	USD	.SOF5ESSO	SOF5ESSO Index
Wisdomtree Physical Gold ETF	USD	PHAU.L	PHAU LN Equity

3. CALCULATION OF THE INDEX

3.1. INDEX FORMULA

The level of the INDEX is calculated according to the following formula:

As of the START DATE:

$$Index_0 = 1000$$

On each CALCULATION DAY following the START DATE

$$IndexLevel_t = max\left(0, IndexLevel_{t-1} \cdot \left(1 + w_{1,t-1} \cdot \left(\frac{p_{1,t}}{p_{1,t-1}} - 1\right) + w_{2,t-1} \cdot \left(\frac{p_{2,t}}{p_{2,t-1}} - 1\right)\right)\right)$$

Where:

$Index_t$: The level of the INDEX as of CALCULATION DAY t.

$Index_{t-1}$: The level of the INDEX as of CALCULATION DAY t-1.

$w_{i,t-1}$: Weight of asset i at time t.

$p_{1,t}$: Compo EUR S&P 500 rolling future excess return level (asset 1) at time t.

$p_{2,t}$: Compo EUR Gold ETF excess return level (asset 2) at time t.

3.2. EXCESS RETURN CALCULATION

The excess return level at time t defined as follows:

$$p_{1,t} = p_{1,t-j} \cdot \left(1 + \left(\frac{EURUSD_{t-j}}{EURUSD_t}\right) \cdot \left(\frac{AssetLevel_{1,t}}{AssetLevel_{1,t-j}} - \frac{MSCF1EUR_t}{MSCF1EUR_{t-j}}\right)\right)$$

And

$$p_{2,t} = p_{2,t-j} \cdot \left(\frac{EURUSD_{t-j}}{EURUSD_t} \cdot \frac{AssetLevel_{2,t}}{AssetLevel_{2,t-j}} - R_{t-j} \cdot \frac{Act_{t,t-j}}{360}\right)$$

Where:

$p_{1,t}$: Compo EUR S&P 500 rolling future excess return level.

$p_{2,t}$: Compo EUR Gold ETF excess return level.

$AssetLevel_{1,t}$: Closing level at time t of SOF5ESSO.

$AssetLevel_{2,t}$: Closing level a time t of PHAU LN WisdomTree Physical Gold ETF.

$j = 1$: Number of business days prior to t.

R_{t-j} : ESTR rate defined at time $t - j$.

$Act_{t,t-1}$: Number of calendar days between the business date $t - j$ (included) and t (excluded).

$EURUSD_t$: EURUSD WMCO Curncy at time t.

$MSCF1EUR_t$: Closing level of MSCF1EUR at time t.

3.3. WEIGHTING CALCULATION

The weights as of a business day t are implied from the solution of the following system:

$$\sigma^2 = w_{1,t}^2 \cdot \sigma_{1,t-1}^2 + w_{2,t}^2 \cdot \sigma_{2,t-1}^2 + 2 \cdot w_{1,t} \cdot w_{2,t} \cdot \rho_{t-1} \cdot \sigma_{1,t-1} \cdot \sigma_{2,t-1}$$

$$w_{1,t} + w_{2,t} = X_t$$

Where:

$$a_t = \sigma_{1,t-1}^2 + \sigma_{2,t-1}^2 - 2\rho_{t-1} \cdot \sigma_{1,t-1} \cdot \sigma_{2,t-1}$$

$$b_t = 2X_t \cdot (\rho_{t-1} \cdot \sigma_{1,t-1} \cdot \sigma_{2,t-1} - \sigma_{2,t-1}^2)$$

$$c_t = X_t^2 \cdot \sigma_{2,t-1}^2 - \sigma^2$$

$$D_t = b_t^2 - 4a_t \cdot c_t$$

With:

$\sigma_{1,t-1}$: Standard Deviation of asset i at time t

σ^2 : Volatility Target squared (or Variance Target) (σ^2 = 1% for a volatility target = 10 %)

X_t : Total allocation as of time t (X_t = 1.5)

ρ_t : Correlation between asset 1 and 2 at time t

Depending on the sign of D_t, there are 3 cases to get the exposure of asset 1 and 2:

Case 1: $D_t > 0$

$$w_{1,t} = max\left(0, min\left(X_t, \frac{-b_t + \sqrt{D_t}}{2a_t}\right)\right)$$

$$w_{2,t} = X_t - w_{1,t}$$

Case 2: $D_t = 0$

$$w_{1,t} = max\left(0, min\left(X_t, \frac{-b_t}{2a_t}\right)\right)$$

$$w_{2,t} = X_t - w_{1,t}$$

Case 3: $D_t < 0$, we set $D_t = D_t^* = 0$ such that X_t is rewritten as:

$$X_t^* = min\left(X_t, \sqrt{\frac{\sigma^2 \cdot a_t}{\left(\sigma_{1,t-1}^2 \cdot \sigma_{2,t-1}^2\right) \cdot (1 - \rho_{t-1}^2)}}\right)$$

We recalculate the new b_t^* coefficient using (4) that has now a new value for X_t being $X_t^* \leq X_t$

$w_{1,t}$ and $w_{2,t}$ are determined using new b_t^* and X_t^* values such as:

$$w_{1,t} = max\left(0, min\left(X_t^*, \frac{-b_t^*}{2a_t}\right)\right)$$

$$w_{2,t} = X_t^* - w_{1,t}$$

If $w_{2,t} > CapGold = 20\%$, we solve for a new quadratic equation to find the optimal $w_{1,t}$, where:

$$w_{2,t} = CapGold$$

$$a_t^* = \sigma_{1,t-1}^2$$

$$b_t^* = 2 \cdot CapGold \cdot \rho_{t-1} \cdot \sigma_{1,t-1} \cdot \sigma_{2,t-1}$$

$$c_t^* = CapGold^2 \cdot \sigma_{2,t-1}^2 - \sigma^2$$

$$D_t^* = {b_t}^{*^2} - 4a_t^* \cdot c_t^*$$

$$w_{1,t} = max\left(0, min\left(X_t - CapGold, \frac{-b_t^* + \sqrt{D_t^*}}{2a_t^*}\right)\right)$$

If either $w_{1,t}$ or $w_{2,t}$ in this process is equal to 0, we set:

$$w_{1,t} = max\left(0, min\left(X_t, w_{1,t}, \frac{\sigma}{\sigma_{1,t-1}}\right)\right)$$

If $w_{2,t} = 0$ (and vice versa if $w_{1,t} = 0$)

As final steps, for each asset i at time t, we can redefine $w_{i,t}$ depending on the following conditions:

- If:

  $$|w_{1,t} - w_{1,t-1}| + |w_{2,t} - w_{2,t-1}| \leq 5$$

  Then:

  $$w_{i,t} = w_{i,t-1}$$

- $w_{i,t}$ can't be higher or lower than $w_{i,t-1}$ ±40%:

  $$w_{i,t} = max(min(w_{i,t}, w_{i,t-1} + 40\%), w_{i,t-1} - 40\%)$$

3.4. STANDARD DEVIATION CALCULATION

$$\sigma^2_{short,i,t} = \lambda_{short} \cdot \sigma^2_{short,i,t-1} + \frac{252}{j} \cdot (1 - \lambda_{short}) \cdot ln\left(\frac{p_{i,t}}{p_{i,t-j}}\right)^2$$

$$\sigma^2_{long,i,t} = \lambda_{long} \cdot \sigma^2_{long,i,t-1} + \frac{252}{j} \cdot (1 - \lambda_{long}) \cdot ln\left(\frac{p_{i,t}}{p_{i,t-j}}\right)^2$$

$$\sigma_{i,t} = max(\sigma_{short,i,t}, \sigma_{long,i,t})$$

With:

$\lambda_{short} = 0.94$

$\lambda_{long} = 0.97$

$\sigma_{short,i,t}$: Short-term standard deviation of asset i at time t (with $\sigma_{short,i,0} = 0.02$)

$\sigma_{long,i,t}$: Long-term standard deviation of asset i at time t (with $\sigma_{long,i,0} = 0.02$)

3.5. CORRELATION CALCULATION

$$Cov_{short,t} = \lambda_{short} \cdot Cov_{short,t-1} + \frac{252}{j} \cdot (1 - \lambda_{short}) \cdot ln\left(\frac{p_{1,t}}{p_{1,t-j}}\right) \cdot \left(\frac{p_{2,t}}{p_{2,t-j}}\right)$$

$$Cov_{long,t} = \lambda_{long} \cdot Cov_{long,t-1} + \frac{252}{j} \cdot (1 - \lambda_{long}) \cdot ln\left(\frac{p_{1,t}}{p_{1,t-j}}\right) \cdot \left(\frac{p_{2,t}}{p_{2,t-j}}\right)$$

$$\rho_{short,t} = \frac{Cov_{short,t}}{\sigma_{short,1,t} \cdot \sigma_{short,2,t}}$$

$$\rho_{long,t} = \frac{Cov_{long,t}}{\sigma_{long,1,t} \cdot \sigma_{long,2,t}}$$

$$\rho_t = \max\left(\rho_{short,t}, \rho_{long,t}\right)$$

With:

$Cov_{short,t}$: The short-term covariance between asset 1 and 2 at time t. $Cov_{short,0} = \frac{0.005}{252}$

$Cov_{long,t}$: The long-term covariance between asset 1 and 2 at time t. $Cov_{long,0} = \frac{0.005}{252}$

ρ_t: Correlation of asset 1 and 2 as of time t

3.6. ACCURACY

The level of the INDEX will be rounded to 2 decimal places. The level of the UNDERLYING INDEX used in the calculation of the INDEX will not be rounded.

3.7. RECALCULATION

SOLACTIVE makes the greatest possible efforts to accurately calculate and maintain its indices. However, errors in the determination process may occur from time to time for variety reasons (internal or external) and therefore, cannot be completely ruled out. SOLACTIVE endeavors to correct all errors that have been identified within a reasonable period of time. The understanding of "a reasonable period of time" as well as the general measures to be taken are generally depending on the underlying and is specified in the SOLACTIVE Correction Policy, which is incorporated by reference and available on the SOLACTIVE website: https://www.solactive.com/documents/correction-policy/.

3.8. MARKET DISRUPTION

In periods of market stress SOLACTIVE calculates its indices following predefined and exhaustive arrangements as described in the SOLACTIVE Disruption Policy, which is incorporated by reference and available on the SOLACTIVE website: https://www.solactive.com/documents/disruption-policy/. Such

market stress can arise due to a variety of reasons, but generally results in inaccurate or delayed prices for one or more INDEX COMPONENTS. The determination of the INDEX may be limited or impaired at times of illiquid or fragmented markets and market stress.

4. MISCELLANEOUS

4.1. DISCRETION

Any discretion which may need to be exercised in relation to the determination of the INDEX (for example the determination of the INDEX UNIVERSE (if applicable), the selection of the INDEX COMPONENTS (if applicable) or any other relevant decisions in relation to the INDEX) shall be made in accordance with strict rules regarding the exercise of discretion or expert judgement.

4.2. METHODOLOGY REVIEW

The methodology of the INDEX is subject to regular review, at least annually. In case a need of a change of the methodology has been identified within such review (e.g. if the underlying market or economic reality has changed since the launch of the INDEX, i.e. if the present methodology is based on obsolete assumptions and factors and no longer reflects the reality as accurately, reliably and appropriately as before), such change will be made in accordance with the SOLACTIVE Methodology Policy, which is incorporated by reference and available on the SOLACTIVE website: https://www.solactive.com/documents/methodology-policy/.

Such change in the methodology will be announced on the SOLACTIVE website under the Section "Announcement", which is available at https://www.solactive.com/news/announcements/. The date of the last amendment of this INDEX is contained in this GUIDELINE.

4.3. CHANGES IN CALCULATION METHOD

The application by the INDEX ADMINISTRATOR of the method described in this document is final and binding. The INDEX ADMINISTRATOR shall apply the method described above for the composition and calculation of the INDEX. However, it cannot be excluded that the market environment, supervisory, legal and financial or tax reasons may require changes to be made to this method. The INDEX ADMINISTRATOR may also make changes to the terms and conditions of the INDEX and the method applied to calculate the INDEX that it 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 ADMINISTRATOR is not obliged to provide information on any such modifications or changes. Despite the modifications and changes, the INDEX ADMINISTRATOR will take the appropriate steps to ensure a calculation method is applied that is consistent with the method described above.

4.4. TERMINATION

SOLACTIVE makes the greatest possible efforts to ensure the resilience and continued integrity of its indices over time. Where necessary, SOLACTIVE follows a clearly defined and transparent procedure to adapt Index methodologies to changing underlying markets (see Section 5.2 "Methodology Review") in order to maintain continued reliability and comparability of the indices. Nevertheless, if no other options are available the orderly cessation of the INDEX may be indicated. This is usually the case when the underlying market or economic reality, which an index is set to measure or to reflect, changes substantially and in a way not foreseeable at the time of inception of the index, the index rules, and particularly the selection criteria, can no longer be applied coherently or the index is no longer used as the underlying value for financial instruments, investment funds and financial contracts.

SOLACTIVE has established and maintains clear guidelines on how to identify situations in which the cessation of an index is unavoidable, how stakeholders are to be informed and consulted and the procedures to be followed for a termination or the transition to an alternative index. Details are specified in the SOLACTIVE Termination Policy, which is incorporated by reference and available on the SOLACTIVE website: https://www.solactive.com/documents/termination-policy/.

4.5. OVERSIGHT

An oversight committee composed of staff from SOLACTIVE and its subsidiaries (the "**OVERSIGHT COMMITTEE**") is responsible for decisions regarding any amendments to the rules of the INDEX. Any such amendment, which may result in an amendment of the GUIDELINE, must be submitted to the OVERSIGHT COMMITTEE for prior approval and will be made in compliance with the Methodology Policy, which is available on the SOLACTIVE website: https://www.solactive.com/documents/methodology-policy/.

5. DEFINITIONS

"BENCHMARK REGULATION" shall have the meaning as defined in Section "Introduction".

"BMR" shall have the meaning as defined in Section "Introduction".

"BUSINESS DAY" is a day on which the New York Stock Exchange and London Stock Exchange are open for general business.

"**CALCULATION DAY**" is every weekday from Monday to Friday which all index component levels are published.

"CLOSE OF BUSINESS" is the calculation time of the closing level of the INDEX as outlined in Section 1.4.

The **"CLOSING PRICE"** in respect of an INDEX COMPONENT and a TRADING DAY is a security's final regular-hours TRADING PRICE published by the EXCHANGE and determined in accordance with the EXCHANGE regulations. If the EXCHANGE has no or has not published a CLOSING PRICE in accordance with the EXCHANGE rules for an INDEX COMPONENT, the last TRADING PRICE will be used. For the avoidance of doubt, the CLOSING PRICE of the UNDERLYING INDEX is calculated and published by SOLACTIVE.

"GUIDELINE" shall have the meaning as defined in Section "Introduction".

"INDEX" shall have the meaning as defined in Section "Introduction".

"INDEX ADMINISTRATOR" shall have the meaning as defined in Section "Introduction".

"INDEX COMPONENT" is each security reflected in the UNDERLYING INDEX.

"INDEX UNIVERSE REQUIREMENTS" shall have the meaning as defined in Section 2.1.

"INDEX UNIVERSE" is the sum of all financial instruments which fulfill the INDEX UNIVERSE REQUIREMENTS.

"LIVE DATE" shall have the meaning as defined in Section 1.3.

"OVERSIGHT COMMITTEE" shall have the meaning as defined in Section 4.5.

"SOLACTIVE" shall have the meaning as defined in Section "Introduction".

"START DATE" shall have the meaning as defined in Section 1.3.

"UNDERLYING INDEX" shall have the meaning as defined in Section 2.2.

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