

# INDEX GUIDELINE

*SMIDAI - Solactive Momentum Intelligent Dynamic  
Allocation Index*

*Version 1.0*

*26 February 2019*



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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 the SMIDAI - Solactive Momentum Intelligent Dynamic Allocation Index (the "Index"). Any amendments to the rules made to the Guideline are approved by the Index Committee specified in Section 5.5. The Index is calculated, administered and published by Solactive AG ("Solactive") assuming the role as index administrator (the "Index Administrator"). The name "Solactive" is trademarked.

The Guideline and the policies and guidelines 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

The SMIDAI Index ("Index") is a USD (the "Index Currency") denominated index that uses a rule-based, quantitative, long only asset allocation strategy index. The Index uses modern portfolio theory principles and the related concept of efficient frontier to maximize returns for a given level of risk, in this case a target volatility gap of 5%-7.5%.

The Index is momentum based, it dynamically allocates across a diversified basket of 27 assets (the "Assets") composed of 26 ETFs and a Cash index. Each Asset is part of a sub-basket, of which there are seven (the "sub-Baskets") in the index. The sub-Baskets are classified as High Tech, Healthcare, Developed Markets, Bonds, Emerging markets, Commodity and Cash. The weight of each Asset is subject to an Asset Cap and the weight of each sub-Basket is subject to a sub-Basket Cap.

The Index rebalances monthly over three Index Business Days. The Index is an Excess Return index and reflects the weighted performance of the basket of Assets in excess of the Cash index.

The Index also incorporates a fee of 1.00% per annum, deducted daily. A gross version of the Index, that excludes the fee, is also calculated.

### 1.2. IDENTIFIERS AND PUBLICATION

The Index is published under the following identifiers:

Name	ISIN	Currency	Type	RIC	BBG ticker
SMIDAI - Solactive Momentum Intelligent Dynamic Allocation Index	DE000SLA7V35	USD	Volatility Target	-	SMIDAI Index

The Index is published 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. In the event that data cannot be provided to the price marketing services of Boerse Stuttgart GmbH, the Index cannot be published.

### 1.3. INITIAL LEVEL OF THE INDEX

The initial level of the Index on 26<sup>th</sup> March 2007 (the "Start Date") is 100.

### 1.4. PRICES AND CALCULATION FREQUENCY

The level of the Index is calculated on each Index Business Day from 8 a.m. to 10 p.m. EST based on the trading prices on the respective Exchanges on which the Index Components are listed. The most recent



trading prices of the Index Components are used. To calculate the end of day index value, the trading prices at 4 p.m. EST are used.

Should there be no current trading price for an Index Component available on Reuters, the most recent trading price on Reuters for the preceding Index Business Day is used in the calculation.

## 1.5. DEFINITIONS IN RESPECT OF SECTION 1

This section contains defined terms used in Section 1 and, if applicable, other Sections of the Guideline.

“Index Business Day” means in respect of any Index constituent, each day on which the Exchanges in New York (NYSE, NYSE Arca, Nasdaq GM) and Chicago (CBOE BZX) are scheduled to be open for trading.

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

“Index Component” is each constituent as set out in the table in Section 2.1.

“Index Currency” is the currency specified in the column “Currency” in the table in Section 1.2.

“Start Date” is 26<sup>th</sup> March 2007.

“Trading Price” is in respect to an Index Component and a Trading Day is the most recent price to be used in the index calculation on this Trading Day determined in accordance with the Exchange regulations. If the Exchange has no trading price for an Index Component for this Trading day, the most recent trading price for the preceding Trading Day is used in the calculation.

“Asset Cap” is in respect to an Index Component the upper percentage weight it can take in a portfolio. Generally, it can range from 0% to 100%.



## 2. CALCULATION OF THE INDEX

### 2.1. INDEX CONSTITUENTS

The Index allocates dynamically across the seven different sub-Baskets through a diversified basket of 27 Assets (each, an "Index Component") consisting of 26 ETFs and 1 Cash index. Each ETF Component is selected based on two main criteria:

1. Replication method used relative to its respective Reference Benchmark Index, and
2. Liquidity as measured by market capitalization and daily traded volume.

Each Asset's weight in a sub-Basket is subject to an "Asset Cap" and each sub-Basket's weight is subject to a "sub-Basket Cap" (Asset Cap and sub-Basket Cap collectively "Caps"). The Caps have been chosen to allow the Index to allocate across the different sub-Baskets with conviction while aiming to be diversified. Note that the sum of all asset weights within each sub-basket as well as the sum of all sub-basket weights should equal to 100%.

Initial values for the Index, the sub-baskets and for the total return computations should all be taken equal to 100.

The table below (Table 2.1.1) contains a brief description of the 27 Components that the Index can select from.

sub-Basket	#	Index Component	Ticker	Exchange	Asset Cap	sub-Basket Cap	CCY
High Tech	1	ROBO Global Robotics and Automation Index ETF	ROBO UP Equity	NYSE Arca	90.0%	70.0%	USD
	2	iShares Global Comm Services ETF	IXP UP Equity	NYSE Arca	90.0%		USD
	3	Invesco NASDAQ Internet ETF	PNQI UQ Equity	Nasdaq GM	30.0%		USD
	4	iShares PHLX Semiconductor ETF	SOXX UQ Equity	Nasdaq GM	90.0%		USD
		ICE LIBOR USD 3 Month	US0003M Index	NYSE	10.0%		USD
Healthcare	5	Solactive Smart Health Care GTR Index	STRGVTTTR Index	NYSE	80.0%	40.0%	USD
	6	iShares Nasdaq Biotechnology ETF	IBB UQ Equity	Nasdaq GM	10.0%		USD
	7	iShares U.S. Healthcare ETF	IYH UP Equity	NYSE Arca	80.0%		USD
	8	iShares U.S. Medical Devices ETF	IHI UP Equity	NYSE Arca	20.0%		USD
	9	Invesco Dynamic Pharmaceuticals ETF	PJP UP Equity	NYSE Arca	50.0%		USD
	10	First Trust NYSE Arca Biotechnology Index Fund	FBT UP Equity	NYSE Arca	70.0%		USD



		ICE LIBOR USD 3 Month	US0003M Index	NYSE	10.0%		USD
Developed Markets	11	Invesco QQQ Trust Series 1	QQQ UP Equity	NYSE Arca	80.0%		USD
	12	SPDR S&P 500 ETF Trust	SPY UP Equity	NYSE Arca	70.0%		USD
	13	iShares Edge MSCI USA Momentum Factor ETF	MTUM UF Equity	CBOE BZX	80.0%	50.0%	USD
	14	Invesco S&P 500 Low Volatility ETF	SPLV UP Equity	NYSE Arca	60.0%		USD
			ICE LIBOR USD 3 Month	US0003M Index	NYSE	10.0%	
Emerging Markets	15	iShares MSCI Brazil ETF	EWZ UP Equity	NYSE Arca	60.0%		USD
	16	iShares MSCI Emerging Markets ETF	EEM UP Equity	NYSE Arca	40.0%		USD
	17	iShares MSCI EAFE ETF i	EFA UP Equity	NYSE Arca	30.0%		USD
	18	iShares Latin America 40 ETF	ILF UP Equity	NYSE Arca	30.0%	30.0%	USD
	19	Xtrackers Harvest CSI 300 China A-Shares ETF	ASHR UP Equity	NYSE Arca	70.0%		USD
	20	iShares China Large-Cap ETF	FXI UP Equity	NYSE Arca	90.0%		USD
			ICE LIBOR USD 3 Month	US0003M Index	NYSE	10.0%	
Com-modity	21	iShares Gold Trust	IAU UP Equity	NYSE Arca	90.0%		USD
	22	iShares U.S. Oil & Gas Exploration & Production ETF	IEO UF Equity	CBOE BZX	20.0%	20.0%	USD
			ICE LIBOR USD 3 Month	US0003M Index	NYSE	10.0%	
Bonds	23	Invesco National AMT-Free Municipal Bond ETF	PZA UP Equity	NYSE Arca	50.0%		USD
	24	iShares 20+ Year Treasury Bond ETF	TLT UQ Equity	Nasdaq GM	90.0%		USD
	25	iShares iBoxx \$ Investment Grade Corporate Bond ETF	LQD UP Equity	NYSE Arca	60.0%	80.0%	USD
	26	Vanguard Extended Duration Treasury ETF	EDV UP Equity	NYSE Arca	60.0%		USD
			ICE LIBOR USD 3 Month	US0003M Index	NYSE	10.0%	
Cash	27	ICE LIBOR USD 3 Month	US0003M Index	NYSE	100.0%	40.0%*	USD

\*The cap can increase by increments of 10% (subject to a maximum weight of 100%) in accordance with the Portfolio Optimization provisions in Index Construction.





## 2.2. INDEX LEVEL CALCULATION

The Index is calculated as a Volatility Target on an Excess Return index. On the Index Start Date ( $t=0$ ):

$$DI_0 = 100$$

On each Index Business Day  $t$ , the Index will be calculated as follows:

$$DI_t = DI_{t-1} * \left[ 1 + Exp_{t-1} \left( \frac{I_t}{I_{t-1}} - 1 \right) - Fee_{div} * \frac{Days_{t-1,t}}{360} \right]$$

$DI_t$	Index Level of the SMIDAI Index for Index Business Day $t$ .
$DI_{t-1}$	Index Level of the SMIDAI Index for Index Business Day $t-1$ .
$Exp_{t-1}$	Level of the Target Exposure for Index Business Day $t-1$ .
$I_t$	Level of the Excess Return Index for Index Business Day $t$ .
$I_{t-1}$	Level of the Excess Return Index for Index Business Day $t-1$ .
$Fee_{div}$	Synthetic Dividend (1.75% per annum).
$Days_{t-1,t}$	Number of calendar days from but excluding Index Business Day $t-1$ to and including Index Business Day $t$ .

## 2.3. TARGET EXPOSURE CALCULATION

On each Index Business Day  $t$ , the Target Exposure will be calculated as follows:

$$Exp_t = \min(MaxExp, \frac{TargetVol}{RealizedVol_{t-1}})$$

$MaxExp$	Maximum Exposure (250%).
$TargetVol$	Level of the target volatility (8.5%).
$RealizedVol_{t-1}$	Level of the Realized Volatility for Index Business Day $t-1$ .

## 2.4. REALIZED VOLATILITY CALCULATION

On each Index Business Day  $t$ , the Realized Volatility will be calculated as follows:



$$RealizedVol_t = \sqrt{\frac{252}{L} * \sum_{i=0}^{L-1} (r_{t-i} - \overline{r_{t-i}})^2}$$

$L$	20 Index Business Days, the Volatility Window
$r_{t-i}$	$\ln(I_{t-i}/I_{t-i-1})$ , i.e., the log-return of the Excess Return Index on Index Business Day t-i.
$\overline{r_{t-i}}$	Arithmetic mean of the expression, across all summation indices.

## 2.5. EXCESS RETURN INDEX CALCULATION

On the Index Start Date ( $t=0$ ):

$$I_0 = 100$$

On each Index Business Day t, the Excess Return Index will be calculated as follows:

$$I_t = I_{t-1} * \left[ 1 + \left( \frac{RP_t}{RP_{t-1}} - 1 \right) - \left( \frac{C_t}{C_{t-1}} - 1 \right) - Fee * \frac{Days_{t-1,t}}{360} \right]$$

$I_t$	Index Level of the Excess Return Index for Index Business Day t.
$I_{t-1}$	Index Level of the Excess Return Index for Index Business Day t-1.
$RP_t$	Level of the Reference Portfolio for Index Business Day t.
$RP_{t-1}$	Level of the Reference Portfolio for Index Business Day t-1.
$C_t$	Level of the Cash Index for Index Business Day t.
$C_{t-1}$	Level of the Cash Index for Index Business Day t-1.
$Days_{t-1,t}$	Number of calendar days from but excluding Index Business Day t-1 to and including Index Business Day t.
Fee	1% per annum.

## 2.6. REFERENCE PORTFOLIO CALCULATION

On each Index Business Day t, the Reference Portfolio should be calculated as follows:

- Between two Rebalancing Periods, i.e. for  $S_d^{m-1} + 3 < t < S_d^m$ :



$$RP_t = RP_{S_d^{m-1}+3} * \sum_{i=1}^{27} sBW_{m-1}^j * W_{m-1}^i * TR_{i,t} / TR_{i,S_d^{m-1}+3}$$

$S_d^{m-1}$  The immediately preceding Selection Date, as defined in the Section 3.1.

$S_d^m$  The immediately following Selection Date.

$RP_{S_d^{m-1}+3}$  Level of the Reference Portfolio on Index Business Day  $S_d^{m-1} + 3$ .

$sBW_{m-1}^j$  Monthly sub-Basket Weight set for *sub – Basket<sub>j</sub>*, which contains *Asset<sub>i</sub>* in the Reference Portfolio, associated with Selection Date  $S_d^{m-1}$  as defined in section 3.12.

$W_{m-1}^i$  Asset Weight for *Asset<sub>i</sub>* in *sub – Basket<sub>j</sub>* associated with Selection Date  $S_d^{m-1}$  as defined in section 3.6.

$TR_{i,t}$  Level of the Total Return of *Asset<sub>i</sub>* on Index Business Day t as defined in section 2.7.

$TR_{i,S_d^{m-1}+3}$  Level of the Total Return of *Asset<sub>i</sub>* on Index Business Day  $S_d^{m-1} + 3$ .

- During the rebalancing period, i.e. for  $S_d^m + 1 \leq t \leq S_d^m + 3$ :

$$RP_t = RP_{t-1} * \left[ \beta_g * \left( \sum_{i=1}^{27} sBEW_{i,t}^m * TR_{i,t} / TR_{i,t-1} \right) + (1 - \beta_g) * \left( \sum_{i=1}^{27} sBW_m^j * W_m^i * TR_{i,t} / TR_{i,t-1} \right) \right]$$

$RP_{t-1}$  Level of the Reference Portfolio on Index Business Day t-1.

$g$   $t - S_d^m$ .

$(\beta_1; \beta_2; \beta_3) = \left( 1; \frac{2}{3}; \frac{1}{3} \right)$ .

$sBEW_{i,t}^m$  Effective weight for *Asset<sub>i</sub>* on Index Business Day t, defined as:

$$sBEW_{i,t}^m = \frac{sBW_{m-1}^j * W_{m-1}^i * \left( \frac{TR_{i,t-1}}{TR_{i,S_d^{m-1}+3}} \right)}{\left( \sum_{i=1}^{27} sBW_{m-1}^j * W_{m-1}^i * \frac{TR_{i,t-1}}{TR_{i,S_d^{m-1}+3}} \right)}$$

$TR_{i,t-1}$  Level of the Total Return of *Asset<sub>i</sub>* on Index Business Day t-1.



$sBW_m^j$	Monthly sub-Basket Weight set for <i>sub – Basket<sub>j</sub></i> , which contains <i>Asset<sub>i</sub></i> in the Reference Portfolio, associated with Selection Date $S_d^m$ as defined in section 3.12.
$W_m^i$	Asset Weight for <i>Asset<sub>i</sub></i> in <i>sub – Basket<sub>j</sub></i> associated with Selection Date $S_d^m$ as defined in section 3.6.

We can notice that the Rebalancing Period is defined as the period of three Index business days commencing from  $S_d + 1$ .

For 26<sup>th</sup> March 2007 (the “Start Date” and “Initial Rebalancing Date”), the reference portfolio takes a value of 100.

On the Start Date, there is an initial rebalance that is not smoothed over three days. Rather the first weights from day 1 are applied and the calculation for the first month uses  $S_d^m$  instead of  $S_d^{m-1} + 3$  as for this specific period we have done the whole rebalancing from day 1.

## 2.7. ASSET TOTAL RETURNS

On each Index Business Day  $t$ , for each *Asset<sub>i</sub>* listed in Table 2.1, excluding Cash, the Index Administrator will calculate the total return of *Asset<sub>i</sub>* ( $TR_{i,t}$ ) assuming the reinvestment of the dividend and capital gain distributions as follows:

The total return Cash index is the same as the Cash index and is calculated as follows:

$$TR_{Cash,t} = C_t = C_{t-1} * \left(1 + r_{t-1} * \frac{Days_{t-1,t}}{360}\right)$$

$C_t$	Level of the Cash index for Index Business Day $t$ .
$r_{t-1}$	ICE Libor USD 3 Month value as of Index Business Day $t-1$ .

Total return for *Asset<sub>i</sub>* on Index Business day  $t$  is determined as:

$$TR_{i,t} = TR_{i,t-1} * \frac{(p_{i,t} + Div_{i,t})}{p_{i,t-1}}$$

$p_{i,t}$	Price of <i>Asset<sub>i</sub></i> on Index Business Day $t$ .
$Div_{i,t}$	Dividend of <i>Asset<sub>i</sub></i> on Index Business Day $t$ .
$p_{i,t-1}$	Price of <i>Asset<sub>i</sub></i> on Index Business Day $t-1$ .

The initial value of TR for each *Asset<sub>i</sub>* was set to 100.



## 2.8. ACCURACY

Index Levels are published end of day on Bloomberg with levels rounded to two decimal places.

## 2.9. RECALCULATION

Solactive makes the greatest possible efforts to accurately calculate and maintain its indices. However, errors in the index 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: [www.solactive.com](http://www.solactive.com).

## 2.10. 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: [www.solactive.com](http://www.solactive.com). 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.

# 3. REBALANCE

## 3.1. INDEX SELECTION DATE

On each Index Selection Event a Portfolio Optimization is performed and the Administrator will revise the composition of the index. The selection of the Index Components is fully rule-based and the Index Administrator has no discretion.

An Index Selection Event is triggered:

- On a monthly basis, a Selection Date ( $S_d^m$ ) is the fourth Index Business Day before the last Index Business Day of the month ' $m$ '.

The rebalancing of the index is then performed during the Rebalancing Period. The latter is defined as the period of three Index Business Days commencing from, but excluding, the Selection Date  $S_d^m$ .



### 3.2. ASSET OBSERVATION PERIOD RETURN CALCULATION

For each *Asset<sub>i</sub>* and each Observation Period, the following will be computed on the monthly Selection Date  $S_d^m$ :

$$Ret_{i,S_d^m}^{Obs\_Short} = TR_{i,S_d^m} / TR_{i,S_d^{m-3}} - 1$$

$$Ret_{i,S_d^m}^{Obs\_Long} = TR_{i,S_d^m} / TR_{i,S_d^{m-6}} - 1$$

### 3.3. SUB-BASKET PERFORMANCE CALCULATION

The Performance of an *Eligible sub – Basket<sub>j</sub>* over the relevant Observation Period is calculated in accordance with the following formula:

$$Perf_{j,S_d^m}^{Obs\_Short} = \sum_{i=1}^n \alpha_{j,i}^{Obs\_Short} * Ret_{i,S_d^m}^{Obs\_Short}$$

$$Perf_{j,S_d^m}^{Obs\_Long} = \sum_{i=1}^n \alpha_{j,i}^{Obs\_Long} * Ret_{i,S_d^m}^{Obs\_Long}$$

$Perf_{j,S_d^m}^{Obs\_Short}$  Performance of the *Eligible sub – Basket<sub>j</sub>* over *Obs\_Short* as of Monthly Selection Date  $S_d^m$ .

$Perf_{j,S_d^m}^{Obs\_Long}$  Performance of the *Eligible sub – Basket<sub>j</sub>* over *Obs\_Long* as of Monthly Selection Date  $S_d^m$ .

$\alpha_{j,i}^{Obs\_Short}$  Weight of *Asset<sub>i</sub>* within *Eligible sub – Basket<sub>j</sub>* over *Obs\_Short*.

$\alpha_{j,i}^{Obs\_Long}$  Weight of *Asset<sub>i</sub>* within *Eligible sub – Basket<sub>j</sub>* over *Obs\_Long*.

$n$  Number of assets included in *Eligible sub – Basket<sub>j</sub>*.

### 3.4. SUB-BASKET VARIANCE CALCULATION

The Annualized Realized Variance of an *Eligible sub – Basket<sub>j</sub>* for the relevant Variance Observation Period (*Vobs*) is calculated on Selection Date  $S_d^m$  in accordance with the following formula:

$$Var_{j,S_d^m} = \sum_{i,k=1}^n \alpha_i * \alpha_k * COV_{i,k}^{Vobs}$$



<b><i>Vobs</i></b>	Relevant Variance Observation Period at Selection Date $S_d^m$ and corresponds to a 126 Index Business Days Look-Back Period starting from Selection Date $S_d^m$ .
$\alpha_i$	Weight of $Asset_i$ within <i>Eligible sub – Basket<sub>j</sub></i> .
$n$	Number of assets included in <i>Eligible sub – Basket<sub>j</sub></i> .
$COV_{i,k}^{Vobs}$	Annualized co-variance between $Asset_i$ and $Asset_k$ for the relevant Variance Observation Period <i>Vobs</i> , calculated with the following formula:

$$COV_{i,k}^{Vobs} = \frac{252}{5 * (L - 1)} * \sum_{N=0}^{L-1} \left( \left[ \left( \frac{TR_{i,(S_d^m-N)}}{TR_{i,(S_d^m-N-5)}} - 1 \right) - \bar{R}_i \right] * \left[ \left( \frac{TR_{k,(S_d^m-N)}}{TR_{k,(S_d^m-N-5)}} - 1 \right) - \bar{R}_k \right] \right)$$

with:

$$\bar{R}_i = \frac{1}{L} * \sum_{N=0}^{L-1} \left( \frac{TR_{i,(S_d^m-N)}}{TR_{i,(S_d^m-N-5)}} - 1 \right)$$

$L$	Length of the relevant Variance Observation Period <i>Vobs</i> and is equal to 126 Index Business Days.
$N$	Each Index Business Day within the relevant Variance Observation period <i>Vobs</i> .

### 3.5. SUB-BASKET OPTIMIZATION

On Selection Date  $S_d^m$  and for each Observation Period (*Obs\_Short* and *Obs\_Long*), an Eligible sub-Basket is selected (*P\_Short* and *P\_Long*, respectively) with the highest Performance (as defined in Section 3.3) and with an Annualized Realized Variance (as defined in Section 3.4) closest to the Target Variance Gap of  $(0.05)^2 - (0.075)^2$  (the "Variance Constraint") or less than the bottom border of Target Variance Gap  $(0.05)^2$ . If no solution is found, the lower bound on the variance constraint will be decreased by steps of 0.01 up to a minimum of 0.0. If still no solution is found, the upper bound of the variance constraint is increased by steps of 0.025 up to a maximum of 1.0.

### 3.6. DETERMINATION OF MONTHLY ASSET WEIGHTS

The Monthly Asset Weight  $W_m^i$  to be assigned to each  $Asset_i$  within a Monthly Rebalancing Period will be determined on Selection Date  $S_d^m$  as the average of the weights of  $Asset_i$  within *sub – Basket P\_Long* and *sub – Basket P\_Short* identified with respect to the relevant Selection Date  $S_d^m$  in accordance with the sub-Basket Optimization:

$$W_m^i = 1/2 * (\alpha_i^{Obs\_Long} + \alpha_i^{Obs\_Short})$$



$\alpha_{j,i}^{Obs\_Short}$  Weight of  $Asset_i$  within  $sub - Basket P\_Short$  as of Selection Date  $S_d^m$ .

$\alpha_{j,i}^{Obs\_Long}$  Weight of  $Asset_i$  within  $sub - Basket P\_Long$  as of Selection Date  $S_d^m$ .

The actual weight of each Asset within a Reference sub-Basket determined on the relevant Selection Date may fluctuate during the Monthly Rebalancing Period.

### 3.7. SUB-BASKET CALCULATION

Using Determined Monthly Asset Weights, sub-Basket Total Returns are calculated using monthly weights determined on the Selection Date  $S_d^m$ . On each Index Business Day  $t$ , the sub-Basket Total Returns are computed as follows:

- Between two Rebalancing Periods, i.e. for  $S_d^{m-1} + 3 < t < S_d^m$ :

$$sB_{j,t}^m = sB_{j,S_d^{m-1}+3}^m * \sum_{i=1}^n W_m^i * TR_{i,t} / TR_{i,S_d^{m-1}+3}$$

- During the rebalancing period, i.e. for  $S_d^m + 1 \leq t \leq S_d^m + 3$ :

$$sB_{j,t}^m = sB_{j,t-1}^m * \left[ \beta_l * \left( \sum_{i=1}^n EW_{m,t}^i * TR_{i,t} / TR_{i,t-1} \right) + (1 - \beta_l) * \left( \sum_{i=1}^n W_m^i * TR_{i,t} / TR_{i,t-1} \right) \right]$$

$sB_{j,t-1}^m$  Level of sub-Basket  $j$ 's Total Return on Index Business Day  $t-1$ .

$l$   $t - S_d^m$ .

$(\beta_1; \beta_2; \beta_3) = \left( 1; \frac{2}{3}; \frac{1}{3} \right)$ .

$EW_{m,t}^i$  Effective weight for  $Asset_i$  on Index Business Day  $t$  defined as follows:

$$EW_{m,t}^i = \frac{W_{m-1}^i * \left( TR_{i,t-1} / TR_{i,S_d^{m-1}+3} \right)}{\left( \sum_{i=1}^n W_{m-1}^i * TR_{i,t-1} / TR_{i,S_d^{m-1}+3} \right)}$$





### 3.8. SUB-BASKET OBSERVATION PERIOD RETURN CALCULATION

For each *sub – Basket<sub>j</sub>* and each Observation Period, the following will be computed on the monthly Selection Date  $S_d^m$ :

$$Ret_{j,S_d^m}^{Obs\_Short} = \frac{sB_{j,S_d^m}^m}{sB_{j,S_d^{m-3}}^m} - 1$$

$$Ret_{j,S_d^m}^{Obs\_Long} = \frac{sB_{j,S_d^m}^m}{sB_{j,S_d^{m-6}}^m} - 1$$

### 3.9. PORTFOLIO PERFORMANCE CALCULATION

The Performance of an *Eligible Portfolio<sub>q</sub>* over the relevant Observation Period is calculated in accordance with the following formula:

$$Perf_{q,S_d^m}^{Obs\_Short} = \sum_{j=1}^7 \alpha_{q,j}^{Obs\_Short} * Ret_{j,S_d^m}^{Obs\_Short}$$

$$Perf_{q,S_d^m}^{Obs\_Long} = \sum_{j=1}^7 \alpha_{q,j}^{Obs\_Long} * Ret_{j,S_d^m}^{Obs\_Long}$$

$Perf_{q,S_d^m}^{Obs\_Short}$  Performance of the *Eligible Portfolio<sub>q</sub>* over *Obs\_Short* as of Monthly Selection Date  $S_d^m$ .

$Perf_{q,S_d^m}^{Obs\_Long}$  Performance of the *Eligible Portfolio<sub>q</sub>* over *Obs\_Long* as of Monthly Selection Date  $S_d^m$ .

$\alpha_{q,j}^{Obs\_Short}$  Weight of *sub – Basket<sub>j</sub>* within *Eligible Portfolio<sub>q</sub>* over *Obs\_Short*.

$\alpha_{q,j}^{Obs\_Long}$  Weight of *sub – Basket<sub>j</sub>* within *Eligible Portfolio<sub>q</sub>* over *Obs\_Long*.

### 3.10. PORTFOLIO VARIANCE CALCULATION

The Annualized Realized Variance of an *Eligible Portfolio<sub>q</sub>* for the relevant Variance Observation Period (*Vobs*) is calculated on Selection Date  $S_d^m$  in accordance with the following formula:

$$Var_{q,S_d^m} = \sum_{j,g=1}^7 \alpha_j * \alpha_g * COV_{j,g}^{Vobs}$$



- Vobs*** Relevant Variance Observation Period at Selection Date  $S_d^m$  and corresponds to a 126 Index Business Days Look-Back Period starting from Selection Date  $S_d^m$ .
- $\alpha_j$**  Weight of *sub – Basket<sub>j</sub>* within *Eligible Portfolio<sub>q</sub>*.
- $COV_{j,g}^{Vobs}$**  Annualized co-variance between *sub – Basket<sub>j</sub>* and *sub – Basket<sub>g</sub>* for the relevant Variance Observation Period *Vobs*, calculated with the following formula:

$$COV_{j,g}^{Vobs} = \frac{252}{5 * (L - 1)} * \sum_{N=0}^{L-1} \left( \left[ \left( \frac{SB_{j,(S_d^m-N)}^m}{SB_{j,(S_d^m-N-5)}^m} - 1 \right) - \bar{R}_j \right] * \left[ \left( \frac{SB_{g,(S_d^m-N)}^m}{SB_{g,(S_d^m-N-5)}^m} - 1 \right) - \bar{R}_g \right] \right)$$

with:

$$\bar{R}_j = \frac{1}{L} * \sum_{N=0}^{L-1} \left( \frac{SB_{j,(S_d^m-N)}^m}{SB_{j,(S_d^m-N-5)}^m} - 1 \right)$$

- L*** Length of the relevant Variance Observation Period *Vobs* and is equal to 126 Index Business Days.
- N*** Each Index Business Day within the relevant Variance Observation period *Vobs*.

### 3.11. PORTFOLIO OPTIMIZATION

On Selection Date  $S_d^m$  and for each Observation Period (*Obs\_Short* and *Obs\_Long*), an Eligible Portfolio is selected (*P\_Short* and *P\_Long*, respectively) with the highest Performance (as defined in Section 3.9) and with an Annualized Realized Variance (as defined in Section 3.10) inside the Target Variance Gap of  $(0.05)^2 - (0.075)^2$  (the "Variance Constraint").

If there is no Eligible Portfolio corresponding to the above established rules, then the sub-Basket Cap for Cash will be relaxed by increments of 10% until an Eligible Portfolio is found. Under these conditions, it is possible that the Eligible Portfolio can be 100% Cash.

### 3.12. DETERMINATION OF MONTHLY SUB-BASKET WEIGHTS

The Monthly sub-Basket Weight  $sBW_m^i$  to be assigned to each *sub – Basket<sub>j</sub>* within a Monthly Rebalancing Period will be determined on Selection Date  $S_d^m$  as the average of the weights of *sub – Basket<sub>j</sub>* within *Portfolios P\_Long* and *Portfolios P\_Short* identified with respect to the relevant Selection Date  $S_d^m$  in accordance with Portfolio Optimization:

$$sBW_m^j = 1/2 * (\alpha_j^{ObsLong} + \alpha_j^{ObsShort})$$



$\alpha_j^{Obs\_Short}$  Weight of *sub – Basket<sub>j</sub>* within *Portfolio P\_Short* as of Selection Date  $S_d^m$ .

$\alpha_j^{Obs\_Long}$  Weight of *sub – Basket<sub>j</sub>* within *Portfolio P\_Long* as of Selection Date  $S_d^m$ .

The actual weight of each sub-Basket within a Reference Portfolio determined on the relevant Selection Date may fluctuate during the Monthly Rebalancing Period.

### 3.13. DEFINITIONS IN RESPECT OF SECTION 3

“Observation Period”: For each month ‘*m*’, two observation periods “*Obs\_Short*” and “*Obs\_Long*” are defined as a 3 months and 6 months period preceding Selection Date  $S_d^m$ , respectively, i.e.: the periods starting on Selection Date  $S_d^{m-3}$  and Selection Date  $S_d^{m-6}$ , respectively (each an “Observation Period”).

“Eligible sub-Baskets” is any hypothetical basket that is composed of included Assets and that satisfies the Asset Caps as detailed in Table 2.1. The weight assigned to each Asset in an Eligible sub-Basket may be zero or a positive number.

“Eligible Portfolio” is any hypothetical portfolio that is composed of all seven sub-Baskets and that satisfies the Asset Caps and sub-Basket Caps as detailed in Table 2.1. The weight assigned to each Asset and/or sub-Basket in an Eligible Portfolio may be zero or a positive number.

## 4. MISCELLANEOUS

### 4.1. DISCRETION

Any discretion which may need to be exercised in relation to the determination of the Index (for example, the selection of the Index Components or any other relevant decisions in relation to the Index) shall be in accordance with the Solactive's Discretion Policy, which is available at Solactive's website: [www.solactive.com](http://www.solactive.com).

### 4.2. METHODOLOGY REVIEW

The methodology of the Index is not subject to a regular review.



### 4.3. CHANGES 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. However, it cannot be excluded that the market environment, supervisory, legal, financial or tax reasons may require changes to be made to this method. In such cases the Index Administrator may 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 Sponsor is obliged to provide information on any such modifications or changes to the Index Calculator.

### 4.4. TERMINATION

Solactive makes the greatest possible efforts to ensure the resilience and continued integrity of its indices over time. Nevertheless, if no other options are available the orderly cessation of an 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 Termination Policy, which is incorporated by reference and available on the Solactive website: [www.solactive.com](http://www.solactive.com).

### 4.5. OVERSIGHT

The Index Administrator 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 Index Committee for prior approval and will be made in compliance with the "Solactive Methodology Policy", which is available at [www.solactive.com](http://www.solactive.com).

# CONTACT

**Solactive AG**  
**German Index Engineering**  
Guiollettstr. 54  
60325 Frankfurt am Main  
Germany

Tel.: +49 (0) 69 719 160 00

Fax: +49 (0) 69 719 160 25

Email: [info@solactive.com](mailto:info@solactive.com)

Website: [www.solactive.com](http://www.solactive.com)

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