INDEX GUIDELINE

UBS DYNAMIC RISK ALLOCATION 5% CHF EXCESS RETURN INDEX

Version 1.1

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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 UBS Dynamic Risk Allocation 5% CHF Excess Return 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 administrator (the "**INDEX ADMINISTRATOR**") under the Regulation (EU) 2016/1011 (the "**BENCHMARK REGULATION**" or "**BMR**") from the and including **TRANSITION DATE**. 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

The UBS Dynamic Risk Allocation 5% CHF Excess Return Index formerly known as the Credit Suisse Dynamic Risk Allocation 5% CHF Excess Return Index is an investible index that has the objective of capturing the performance of a long-only exposure to a diversified range of asset classes including equities, bonds, commodities and real estate, with exposure of different asset classes allocated according to a dynamic allocation mechanism combining CDS and Volatility signals.

1.2. IDENTIFIERS AND PUBLICATION

The INDEX is published under the following identifiers:

Name	ISIN	Currency	Type	RIC	BBG ticker
UBS Dynamic Risk Allocation 5% CHF Excess Return Index	DE000SL0MMH9	CHF	ER	.CSEADRA5	CSEADRA5

*ER means that the Index is calculated as Excess Return.

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 LAUNCH DATE is 1000. Historical values from the VOLATILITY CONTROLLED INDEX START DATE (VCISD) to the TRANSITION DATE have been calculated by Credit Suisse International. The closing levels of the Index from the and including the TRANSITION DATE are calculated by Solactive and will be recorded in accordance with Article 8 of the BMR. Levels of the Index published for a period prior to the LAUNCH DATE have been back-tested.

1.4. PRICES AND CALCULATION FREQUENCY

The closing level of the INDEX for each CALCULATION DAY is calculated. This closing level is based on the CLOSING PRICES for the INDEX COMPONENTS as published by their respective index provider.

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 UBS AG ("UBS").

2. INDEX COMPOSITION

2.1. INDEX COMPONENTS

Effective from and including the TRANSITION DATE, the following 10 components (the " UBS COMPONENTS") will serve as INDEX COMPONENT in the calculation of the INDEX :

i	Asset	Index Component i	Format	Currency	Return Type	Ticker
1	Swiss Equity	UBS Market Beta Switzerland Equity Index	Future Index	CHF	Excess Return	UISEMSLE Index
2	US Equity	UBS Market Beta US Equity Index	Future Index	USD	Excess Return	UISEMULL Index
3	European Equity	UBS Market Beta Europe Equity Index	Future Index	EUR	Excess Return	UISEMEER Index
4	Japanese Equity	UBS Market Beta Japan Broad Equity Index	Future Index	JPY	Excess Return	UISEMJTE Index
5	Emerging Market Equity	MSCI Daily TR Net Emerging Markets USD	Index	USD	Total Return	NDUEEGF Index
6	US 10Y Treasuries	UBS 10Y US Treasuries Index	Future Index	USD	Excess Return	MLTAU10E Index
7	European Treasuries	UBS 10Y German Bond Index	Future Index	EUR	Excess Return	MLTAG10E Index
8	Listed Real Estate	FTSE EPRA/NAREIT Developed Net TR USD Index	Index	USD	Total Return	TRNGLU Index
9	Energy	S&P GSCI Energy Official Close Index ER	Index	USD	Excess Return	SPGCENP Index
10	Gold	UBS CMCI Components Gold Index	Index	USD	Excess Return	CTGCER Index

With the following 10 components (each of them an INDEX COMPONENT, together the "INDEX COMPONENTS") only effective up to but excluding the TRANSITION DATE:

i	Asset	Index Component i	Format	Currency	Return Type	Ticker
1	Swiss Equity	MSCI Daily TR Net Switzerland Local	Index	CHF	Total Return	NDDLSZ Index
2	US Equity	CS US Equity Futures Index ER	Future Index	USD	Excess Return	CSRFESUE Index
3	European Equity	CS European Equity Futures Index ER	Future Index	EUR	Excess Return	CSRFVGEE Index
4	Japanese Equity	CS Japanese Equity Futures Index ER	Future Index	JPY	Excess Return	CSRFNKJE Index
5	Emerging Market Equity	MSCI Daily TR Net Emerging Markets USD	Index	USD	Total Return	NDUEEGF Index
6	US 10Y Treasuries	CS 10-Year US Treasury Note Futures Index ER	Future Index	USD	Excess Return	CSRFTYUE Index
7	European Treasuries	CS Euro-Bund Futures Index ER	Future Index	EUR	Excess Return	CSRFRXEE Index
8	Listed Real Estate	FTSE EPRA/NAREIT Developed Net TR USD Index	Index	USD	Total Return	TRNGLU Index[1]
9	Energy	S&P GSCI Energy Official Close Index ER	Index	USD	Excess Return	SPGCENP Index
10	Gold	S&P GSCI Gold Official Close Index ER	Index	USD	Excess Return	SPGCGCP Index

For the avoidance of doubt, on any Calculation Day on and after the Transition Date, the UBS Components will be used for the purposes of calculations defined in Section 4 and 5.

[1] Prior to the inception of Index Component number 8 on February 18, 2005, any reference to Index Component number 8 shall be deemed to refer to the FTSE EPRA/NAREIT Developed TR USD Index (Bloomberg ticker: RUGL Index).

3. INDEX CALCULATION

3.1. INDEX FORMULA

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

On the LAUNCH DATE:

$$Index_0 = 1000$$

On each CALCULATION DAY t:

$$Index_t = Index_{t-1} * \left(1 + Perf_t^{VC} - RC_t^{VC} - CalcFee \times \frac{D_{t-1,t}}{365}\right)$$

Where:

$Index_0$: The level of the INDEX as of the LAUNCH DATE;

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

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

$Perf_t^{VC}$: The Index Performance from CALCULATION DAY t-1 to CALCULATION DAY t;

RC_t^{VC}: The Index Rebalancing Cost as of CALCULATION DAY t;

$CalcFee$: The Index Calculation Fee of 1.55% per annum, deducted daily;

$D_{t-1,t}$: The number of calendar days between CALCULATION DAY t (including) and CALCULATION DAY t-1 (excluding);

3.2. INDEX PERFORMANCE

On each CALCULATION DAY t, the Index Performance is calculated according to the following formula:

$$Perf_t^{VC} = W_{t-1}^{VC} \times \left(\frac{BaseIndex_t}{BaseIndex_{t-1}} - 1\right)$$

Where:

$Perf_t^{VC}$: The Index Performance from CALCULATION DAY t-1 to CALCULATION DAY t.

$BaseIndex_t$: The level of the BASE INDEX as of CALCULATION DAY t

$BaseIndex_{t-1}$: The level of the BASE INDEX as of CALCULATION DAY t-1

W_{t-1}^{VC}: The percentage weight of the INDEX allocated to the BASE INDEX as of CALCULATION DAY t-1.

3.3. INDEX REBALANCING COST

The index rebalancing cost is calculated according to the following formula:

On the VOLATILITY CONTROLLED INDEX START DATE:

$$RC_{VCISD}^{VC} = 0$$

On each CALCULATION DAY t following the VOLATILITY CONTROLLED INDEX START DATE:

$$RC_t^{VC} = \sum_{i=1}^{n} W_{i,t_{Reb}} \times TC_i \times |W_t^{VC} - W_{t-1}^{VC}|$$

Where:

$W_{i,t_{Reb}}$: The percentage weight of Index Component i in the BASE INDEX as implemented on the INDEX REBALANCING DAY t_{Reb};

W_t^{VC}: The percentage weight of the INDEX allocated to the BASE INDEX as of CALCULATION DAY t.

W_{t-1}^{VC}: The percentage weight of the INDEX allocated to the BASE INDEX as of CALCULATION DAY t-1.

TC_i: Transaction Cost for Index Component i, as specified in 4.2.

| . |: The absolute value function, which return the non-negative value of the term evaluated without regard to its sign.

3.4. VOLATILITY CONTROL LEVEL

The volatility control weight is calculated according to the following formula:

On the VOLATILITY CONTROLLED INDEX START DATE:

$$W_{VCISD}^{VC} = \frac{\sigma_{VCISD}^{VC}}{\sigma_{VCISD}}$$

With respect to any following CALCULATION DAY t:

- If $\frac{\sigma_t^{VC}}{\sigma_t} \geq 150\%$, then $W_t^{VC} = 150\%$
- Else if, $\left|\frac{\sigma_t^{VC}}{\sigma_t} - W_{t-1}^{VC}\right| \geq 5\%$ then $W_t^{VC} = \frac{\sigma_t^{VC}}{\sigma_t}$
- Otherwise $W_t^{VC} = W_{t-1}^{VC}$

Where:

σ_t^{VC}: The Volatility Control as of CALCULATION DAY t ;

σ_t: The realized volatility of the BASE INDEX over the period as of CALCULATION DAY t;

W_t^{VC}: The percentage weight of the Index allocated to the Base Index as of CALCULATION DAY t;

W_{t-1}^{VC}: The percentage weight of the Index allocated to the Base Index as of CALCULATION DAY t-1.

3.5. VOLATILITY CALCULATION

With respect to any CALCULATION DAY t volatility is calculated according to the following formula:

$$\sigma_t = \max\left(\sigma_t^{22}, \sigma_t^{66}\right)$$

And:

$$\sigma_t^j = \sqrt{\frac{252}{j-1} \times \sum_{k=0}^{j-1} \ln\left(\frac{BaseIndex_{t-k-Lag}}{BaseIndex_{t-k-Lag-1}}\right)^2}$$

Where:

σ_t: The realized volatility of the BASE INDEX over the period as of CALCULATION DAY t;

Lag : Means 2;

σ_t^{22}: σ_t^j where j is equal 22;

σ_t^{66}: σ_t^j where j is equal 66.

3.6. VOLATILITY CONTROL

The Volatility Control in respect of any CALCULATION DAY t is calculated according to the following formula:

$$\sigma_t^{VC} = max\left[\sigma^-, min\left[\sigma^+, \sigma^+ - \frac{RPerf_{t-Lag} - Budget^-}{Budget^+ - Budget^-} \times [\sigma^+ - \sigma^-]\right]\right]$$

Where:

σ_t^{VC}: The Volatility Control as of CALCULATION DAY t;

σ^-: The minimum volatility control, being 3%;

σ^+: The maximum volatility control, being 5%;

$RPerf_{t-Lag}$: The Index Running Performance as of CALCULATION DAY t-Lag;

Lag : Means 2;

$Budget^-$: The low return budget, being 5%;

$Budget^+$: The high return budget, being 10%.

3.7. INDEX RUNNING PERFORMANCE

The Index Running Performance is calculated according to the following formula:

On each CALCULATION DAY t preceding (and including) VOLATILITY CONTROLLED INDEX START DATE:

$$RPerf_t = 0$$

On each CALCULATION DAY t following (and excluding) the VOLATILITY CONTROLLED INDEX START DATE, and preceding (and including) the calendar day falling one calendar year after the VOLATILITY CONTROLLED INDEX START DATE:

$$RPerf_t = \frac{Index_t}{Index_{VCISD}} - 1$$

On each following CALCULATION DAY t:

$$RPerf_t = \frac{Index_t}{Index_{t-1y}} - 1$$

Where:

$RPerf_t$: The Index Running Performance as of CALCULATION DAY t;

$Index_{t-1y}$: The INDEX level on CALCULATION DAY t – 1y.

$t - 1y$: The calendar day falling one calendar year prior to CALCULATION DAY t if such calendar day is an CALCULATION DAY, otherwise the CALCULATION DAY immediately preceding such calendar day.

4. BASE INDEX CALCULATION

4.1. BASE INDEX FORMULA

The level of the BASE INDEX as of CALCULATION DAY t is calculated according to the following formula:

On the INDEX START DATE:

$$BaseIndex_{ISD} = 1000$$

On each CALCULATION DAY t following the INDEX START DATE:

$$BaseIndex_t = BaseIndex_{t_{Reb}} \times \left(1 + BasePerf_{t_{Reb},t} - RC_t\right)$$

Where:

$BaseIndex_t$: The level of the BASE INDEX as of CALCULATION DAY t;

$BaseIndex_{t_{Reb}}$: The level of the BASE INDEX as of INDEX REBALANCING DAY t_{Reb};

$BasePerf_{t_{Reb},t}$: The Base Index Performance from INDEX REBALANCING DAY t_{Reb} to CALCULATION DAY t;

RC_t: The BASE INDEX rebalancing cost as of CALCULATION DAY t.

t_{Reb}: In respect of any CALCULATION DAY t, the Index Rebalancing Day immediately preceding such CALCULATION DAY t.

4.2. BASE INDEX PERFORMANCE

The Base Index Performance from INDEX REBALANCING DAY t_{Reb} immediately preceding CALCULATION DAY t to CALCULATION DAY t is calculated according to the following formula:

$$BasePerf_{t_{Reb},t} = \sum_{i=1}^{n} W_{i,t_{Reb}} \times \left[\frac{FX_{i,t}}{FX_{i,t_{Reb}}} \times \left(\frac{AIC_{i,t}}{AIC_{i,t_{Reb}}} - 1 \right) - HF_i \times \frac{D_{t_{Reb},t}}{365}^{*} - 2 \times N_{t_{Reb},t}^{Roll_i} \times TC_i^{\nabla} \right]$$

*Holding fees are subject to change following the TRANSITION DATE t_{TD}, please see the table below. For the avoidance of doubt, where the TRANSITION DATE t_{TD} is not an INDEX REBALANCING DAY t_{Reb}, then for each CALCULATION DAY t following the TRANSITION DATE t_{TD} and until the next Index Rebalancing Day, the term $HF_i \times \frac{D_{t_{Reb},t}}{365}$ will be replaced by the following:

$$HF_i' \times \frac{D_{t_{Reb},t_{TD}}}{365} + HF_i \times \frac{D_{t_{TD},t}}{365}$$

∇: Rolling fees are subject to change following the Transition Date t_{TD}, please see the table below. For the avoidance of doubt, where the Transition Date t_{TD} is not an Index Rebalancing Day t_{Reb}, then for each Calculation Day t following the Transition Date t_{TD} and until the next Index Rebalancing Day, the term $2 \times N_{t_{Reb},t}^{Roll_i} \times TC_i$ will be replaced by the following:

$$2 \times \left(N_{t_{Reb},t_{TD}}^{Roll_i} \times TC_i' + N_{t_{TD},t}^{Roll_i} \times TC_i \right)$$

Where:

$BasePerf_{t_{Reb},t}$: The Base Index Performance from INDEX REBALANCING DAY $t_{Reb}$to CALCULATION DAY t

$W_{i,t_{Reb}}$: The Weight of Index Component i in the Base Index as of INDEX REBALANCING DAY t_{Reb};

$AIC_{i,t}$: The Adjusted Index Component Value of Index Component i as of CALCULATION DAY t.

$AIC_{i,t_{Reb}}$: The Adjusted Index Component Value of Index Component i as of INDEX REBALANCING DAY t_{Reb}.

$FX_{i,t}$: The Index Currency/CCY$_i$ FX RATE of Index Component i calculated as of CALCULATION DAY t,

$FX_{i,t_{Reb}}$: The Index Currency/CCY$_i$ FX RATE of Index Component i calculated as of INDEX REBALANCING DAY t_{Reb},

n: The Number of Index Components in the Index Composition.

$D_{t_{Reb},t}$: The number of calendar days between INDEX REBALANCING DAY t_{Reb} (excluding) and CALCULATION DAY t (including);

$N_{t_{Reb},t}^{Roll_i}$: The number of Roll Dates for Index Component i that occurred from, and excluding, Index Rebalancing Day $t_{Reb}$to, and including CALCULATION DAY t;

TC_i: Transaction Cost for Index Component i, as specified in the below table.

$N^{Roll_i}_{t_{Reb},t_{TD}}$: The number of Roll Dates for Index Component i that occurred from, and excluding, INDEX REBALANCING DAY $t_{Reb}$to, and excluding TRANSITION DATE t_{TD};

$N^{Roll_i}_{t_{TD},t}$: The number of Roll Dates for Index Component i that occurred from, and including, TRANSITION DATE t_{TD}, to, and including CALCULATION DAY t

TC'_i: Transaction Cost for Index Component i before TRANSITION DATE t_{TD}, as specified in the below table;

t_{Reb}: In respect of any CALCULATION DAY t, the Index Rebalancing Day immediately preceding such CALCULATION DAY t.

HF'_i: Annualised Holding Fees for Index Component i before TRANSITION DATE t_{TD}, as specified in the below table;

HF_i: Annualised Holding Fees for Index Component i, as specified in the below table;

$D_{t_{Reb},t_{TD}}$: The number of calendar days between INDEX REBALANCING DAY t_{Reb} (excluding) and TRANSITION DATE t_{TD} (excluding);

$D_{t_{TD},t}$: The number of calendar days between TRANSITION DATE t_{TD} (including) and CALCULATION DAY t (including).

*For the avoidance of doubt, in respect of any CALCULATION DAY t from (and including) the TRANSITION DATE t_{TD}, the terms $N^{Roll_i}_{t_{Reb},t}$, are in respect of the UBS COMPONENTS as defined in 2.1 .

i	**Asset**	**Annualised Holding Fees**	**Transaction Cost**	**Roll**
1	Swiss Equity	0.07%[2]	0.05%[3]	3[4]
2	US Equity	0.07%	0.05%	6
3	European Equity	0.07%	0.05%	2
4	Japanese Equity	0.07%	0.05%	2
5	Emerging Market Equity	0.25%	0.10%	N/A
6	US 10Y Treasuries	0.07%	0.025%	2
7	European Treasuries	0.07%	0.025%	2

[2] Prior to the TRANSITION DATE (and excluding), Index Component 1 had Annualised Holding Fees at 0.25%.
[3] Prior to the TRANSITION DATE (and excluding), Index Component 1 had Transaction Cost at 0.10%.
[4] Prior to the TRANSITION DATE (and excluding), Index Component 1 had Roll at N/A.

8	Listed Real Estate	0.25%	0.10%	N/A
9	Energy	0.20%	0.10%	N/A
10	Gold	0.20%	0.10%	N/A

4.3. BASE INDEX REBALANCING COST

The Base Index rebalancing cost is calculated according to the following formula:

On the INDEX START DATE:

$$RC_{ISD} = 0$$

On each CALCULATION DAY t following the INDEX START DATE:

$$RC_t = 1_{t=(t+1)_{Reb}} \times \sum_{i=1}^{n} TC_i \times \left| W_{i,(t+1)_{Reb}} - W_{i,t_{Reb}} \right|$$

Where:

RC_t: The Base Index rebalancing cost on CALCULATION DAY t;

$1_{t=(t+1)_{Reb}}$: Equals 1 if the CALCULATION DAY t is an Index Rebalancing Day and 0 otherwise;

$W_{i,t_{Reb}}$: Percentage Weight of Index Component i in the Base Index as implemented on the Index Rebalancing Day t_{Reb};

$W_{i,(t+1)_{Reb}}$: The percentage weight of Index Component i in the BASE INDEX as implemented on INDEX REBALANCING DAY $(t+1)_{Reb}$ immediately following INDEX REBALANCING DAY t_{Reb};

n: The Number of Index Components in the Index Composition;

t_{Reb}: In respect of any CALCULATION DAY t, the INDEX REBALANCING DAY immediately preceding such CALCULATION DAY t.

4.4. ADJUSTED INDEX COMPONENT VALUE

The Adjusted Index Component Value of Index Component i is calculated according to the following formula on any CALCULATION DAY t, following the INITIAL CALCULATION DATE:

$$AIC_{i,t}{}^{*} = AIC_{i,t-1} \times \left[\frac{IC_{i,t}}{IC_{i,t-1}} + \mathbb{I}_{\{ReturnType_i=TR\}} \times \left(1 - \frac{FC_t^{CCY_i}}{FC_{t-1}^{CCY_i}} \right) \right]$$

Where:

$AIC_{i,t}$: The Adjusted Index Component Value of Index Component i as of CALCULATION DAY t;

$AIC_{i,t-1}$: The Adjusted Index Component Value of Index Component i as of CALCULATION DAY t-1;

$t-1$: The CALCULATION DAY immediately preceding CALCULATION DAY t;

$AIC_{i,0}$: The Adjusted Index Component Value of Index Component i on the INITIAL CALCULATION DATE, being equal to 1000;

$IC_{i,t}$: The Closing Price for Index Component i as of CALCULATION DAY t;

$\mathbb{I}_{\{ReturnType_i=TR\}}$: Equals 1 if Index Component i is specified as "Total Return" in section 2.1, and otherwise, 0, subject to changes in respect to the TRANSITION DATE t_{TD} ;

$FC_t^{CCY_i}$The Value of Funding Component in respect of currency CCY_i as of CALCULATION DAY t;

$FC_{t-1}^{CCY_i}$: The Value of Funding Component in respect of currency CCY_i as of CALCULATION DAY t-1;

CCY_i: The currency in respect of the Index Component i.

*For the avoidance of doubt, in respect of any CALCULATION DAY t from (and including) the TRANSITION DATE t_{TD}, the terms $IC_{i,\ t}$, $IC_{i,\ t-1}$, $\mathbb{I}_{\{ReturnType_i=TR\}}$and CCY_i are in respect of the UBS COMPONENTS as defined in 2.1 .

4.5. FUNDING COMPONENT CALCULATION

The value of the Funding Component in respect of any FUNDING CALCULATION DAY f is calculated according to the following formula:

$$FC_{f_{CCY}}^{CCY} = FC_{f_{CCY}-1}^{CCY} \times \left[1 + \left(FR_{f_{CCY}-1}^{CCY} + FS^{CCY}\right) \times \frac{D_{f_{CCY}-1,f_{CCY}}}{360}\right]$$

Where:

$FC_{f_{CCY}}^{CCY}$: The Value of Funding Component denominated in currency CCY as of FUNDING CALCULATION DAY f_{CCY}

$FC_{f_{CCY}-1}^{CCY}$: The Value of Funding Component denominated in currency CCY as FUNDING CALCULATION DAY $f_{CCY}-1$;

f_{CCY}: The FUNDING CALCULATION DAY f in currency CCY for which a calculation or determination is made.

f_{CCY-1}: The FUNDING CALCULATION DAY immediately preceding FUNDING CALCULATION DAY f in currency CCY for which a calculation or determination is made;

FC_0^{CCY}: The Value of Funding Component on the INITIAL CALCULATION DATE in currency CCY, being equal to 1000;

$FR_{f_{CCY}-1}^{CCY}$: The Funding Rate in respect of currency CCY (as specified in 4.5.1) on FUNDING CALCULATION DAY f-1;

FS^{CCY}The value of Funding Spread being equal to 0.25% for all currencies CCY;

$D_{f_{CCY}-1,f_{CCY}}$: The number of calendar days from but excluding FUNDING CALCULATION DAY f_{CCY}-1 to and including FUNDING CALCULATION DAY f_{CCY}.

4.5.1. Funding Rate

The value of the Funding Rate in respect of any FUNDING CALCULATION DAY f is determined according to the following:

On any FUNDING CALCULATION DAY:

$$FR_t^{CCY} = FundingRate_t^{CCY} + Spread^{CCY}$$

Where:

$FundingRate_t^{CCY}$ and $Spread^{CCY}$ are defined in the following tables:

On any FUNDING CALCULATION DAY before FUNDING RATE SWITCH DATE 1:

Currency (CCY)	**Funding Rate**	**Spread**
CHF	The value for three-month deposits rate in CHF as displayed on Reuters Page LIBOR01	0.00%
USD	The value for three-month deposits rate in USD as displayed on Reuters Page LIBOR01	0.00%

On any FUNDING CALCULATION DAY from (and including) FUNDING RATE SWITCH DATE 1 to (and excluding) FUNDING RATE SWITCH DATE 2:

Currency (CCY)	**Funding Rate**	**Spread**
CHF	The Swiss Average Rate Overnight ("SARON")	0.0031%
USD	The value for three-month deposits rate in USD as displayed on Reuters Page LIBOR01	0.00%

On any FUNDING CALCULATION DAY from (and including) FUNDING RATE SWITCH DATE 2:

Currency (CCY)	**Funding Rate**	**Spread**
CHF	The Swiss Average Rate Overnight ("SARON")	0.0031%
USD	The United States SOFR Secured Overnight Financing Rate (SOFFRRATE Index)	0.26161%

5. REBALANCING METHODOLOGY

5.1. INDEX REBALANCING

Each Index is a weighted basket of the INDEX COMPONENTS. The risk budget with respect to any Index Component is determined by the "Risk Signal" described in 5.2. The risk budget represents the target participation of each Index Component to the overall BASE INDEX risk.

Subject to this risk budget, the weight of each Index Component within the BASE INDEX is calculated once a week, at the close of each INDEX REBALANCING DAY, using an inverse volatility weighting, as described in 5.3. The calculation methodology for determining the level of BASE INDEX is described in 4.1.

The INDEX is rebalanced on a daily basis with the objective of keeping the volatility below a target threshold, as described in 3.4. The calculation methodology for determining the level of the INDEX is described in 3.1.

5.2. RISK SIGNAL

With respect to any CALCULATION DAY t, the Risk Signal is the arithmetic mean of the CDS Signal and Skew Signal, determined according to the following formula:

$$RiskSignal_t = \frac{CDSSignal_{t-Lag} + SkewSignal_{t-Lag}}{2}$$

Where:

$RiskSignal_t$: The Risk Signal as of CALCULATION DAY t;

$CDSSignal_{t-Lag}$: The CDS Signal as of CALCULATION DAY t-Lag;

$SkewSignal_{t-Lag}$: The Skew Signal as of CALCULATION DAY t-Lag;

Lag: Means 2.

5.2.1. CDS Signal

With respect to any SIGNAL CALCULATION DAY s the CDS Signal is calculated according to the following formula:

With respect to INDEX START DATE:

$$CDSSignal_{ISD} = 0$$

With respect to any SIGNAL CALCULATION DAY s following INDEX START DATE:

- If $CDS_s \geq 125\% \times MA_s^{CDS}$, then $CDSSignal_s = 1$, i.e. the CDS Signal is "on";
- If $CDS_s \leq MA_s^{CDS}$, then $CDSSignal_s = 0$, i.e. the CDS Signal is "off";
- Otherwise, $CDSSignal_s = CDSSignal_{s-1}$.

Where:

$CDSSignal_s$: CDS Signal as of SIGNAL CALCULATION DAY s;

$CDSSignal_{s-1}$: CDS Signal as of SIGNAL CALCULATION DAY s-1;

CDS_s: The official closing level of the CDS Component[5] as of SIGNAL CALCULATION DAY s. If the official closing level of the CDS Component is not published on SIGNAL CALCULATION DAY s, CDS_s shall equal the last published official closing level of the CDS Component;

MA_s^{CDS}: The 3-month moving average of the CDS Component in respect of SIGNAL CALCULATION DAY s, as calculated in accordance with the following formula:

$$MA_s^{CDS} = \frac{\sum_{i=0}^{65} CDS_{s-i}}{66}$$

CDS_{s-i}: The official closing level of the CDS Component on SIGNAL CALCULATION DAY s-i. If the official closing level of the CDS Component is not published on Signal Calculation Day s-i, CDS_{s-i} shall equal the last published official closing level of the CDS Component.

5.2.2. Skew Signal

With respect to any SIGNAL CALCULATION DAY s the Skew Signal is calculated according to the following formula:

With respect to INDEX START DATE:

$$SkewSignal_{ISD} = 0$$

With respect to any SIGNAL CALCULATION DAY s following INDEX START DATE:

- If $Skew_s \geq MA_s^{Skew} + 1.5 \times SD_s^{Skew}$, then $SkewSignal_s = 1$, i.e. the Skew Signal is "on";
- Otherwise, $Skew_s = 0$, i.e. the Skew Signal is "off."

$SkewSignal_s$: Skew Signal as of SIGNAL CALCULATION DAY s;

$Skew_s$: The skew of the EQUITY COMPONENT in respect of SIGNAL CALCULATION DAY s, as calculated in accordance with the following formula:

$$Skew_s = (\sigma_s^{80} - \sigma_s^{100}) \times \sigma_s^{100}$$

σ_s^{80}[6]: The Implied Volatility (as defined in Annex A) as of SIGNAL CALCULATION DAY s of the OTC OPTION with:

- an EXPIRATION DATE falling 63 SIGNAL CALCULATION DAYS following SIGNAL CALCULATION DAY s
- a STRIKE PRICE of 80% of EQUITY COMPONENT LEVEL as of SIGNAL CALCULATION DAY s rounded to the closest integer value

[5] For the avoidance of doubt, from the Transition Date CDS Component will refer to Markit iTraxx Europe Main as published by ICE (ICE Contract Symbol: ITRX EUR).

[6] For the calculation of the Risk Signal (defined in section 5.2) on any Signal Calculation Day prior (and excluding) the TRANSITION DATE, σ_s^{80} refers to the implied volatility (extracted from the Credit Suisse Proprietary Implied Volatility Surface) on the EQUITY COMPONENT which has, in respect of SIGNAL CALCULATION DAY s, a tenor of 3 months and a strike of 80%, expressed as a percentage of the EQUITY COMPONENT LEVEL.

σ_s^{100}[7]: The Implied Volatility (as defined in Annex A) as of SIGNAL CALCULATION DAY s of the OTC OPTION with:

- an EXPIRATION DATE falling 63 SIGNAL CALCULATION DAYS following SIGNAL CALCULATION DAY s
- a STRIKE PRICE of 100% of EQUITY COMPONENT LEVEL as of SIGNAL CALCULATION DAY s rounded to the closest integer value

MA_s^{Skew}: The 3-month moving average of the Skew in respect of SIGNAL CALCULATION DAY s, as calculated in accordance with the following formula:

$$MA_s^{Skew} = \frac{\sum_{i=0}^{65} Skew_{s-i}}{66}$$

SD_s^{Skew}: The standard deviation of the skew in respect of the 3-month preceding SIGNAL CALCULATION DAY s, determined in accordance with the following formula:

$$SD_s^{Skew} = \sqrt{\frac{1}{65} \times \sum_{i=0}^{65} \left(Skew_{s-i} - MA_s^{Skew}\right)^2}$$

$Skew_{s-i}$: Skew Signal as of SIGNAL CALCULATION DAY s-i.

If a Skew Signal cannot be determined on a SIGNAL CALCULATION DAY, the Skew Signal shall equal the last determined Skew Signal.

5.3. WEIGHTING PROCEDURE FOR THE INDEX

The Index Component weights are calculated in respect of each INDEX REBALANCING DAY on an end-of-day basis, using the Risk Signal and inverse volatility weighting.

5.3.1. Index Component Volatility

In respect of any CALCULATION DAY t, the volatility of the Index Component i is calculated according to the following formula:

$$\sigma_{i,t} = \sqrt{\frac{252}{65} \times \sum_{k=0}^{65} log\left(\frac{AIC_{i,t-k-Lag}}{AIC_{i,t-k-Lag-1}}\right)^2}$$

Where:

$\sigma_{i,t}$: The volatility of Index Component i on CALCULATION DAY t;

[7] For the calculation of the Risk Signal (defined in section 5.2) on any Signal Calculation Day prior (and excluding) the TRANSITION DATE, σ_s^{100} refers to the implied volatility (extracted from the Credit Suisse Proprietary Implied Volatility Surface) on the EQUITY COMPONENT which has, in respect of SIGNAL CALCULATION DAY s, a tenor of 3 months and a strike of 100%, expressed as a percentage of the EQUITY COMPONENT LEVEL.

$AIC_{i,t-k-Lag}$: The Adjusted Index Component Value of Index Component i on CALCULATION DAY t-k-Lag;

$AIC_{i,t-k-Lag-1}$: The Adjusted Index Component Value of Index Component i on CALCULATION DAY t-k-Lag-1;

Lag: Means 2;

log: The natural logarithm.

5.3.2. Risk Budget

In respect of any CALCULATION DAY t, the Risk Budget of any Index Component I shall be:

- The Risk-On Budget of Index Component i, as specified in the table below, if $RiskSignal_s = 0$, i.e. if the Risk Signal is "Risk-On";
- The Risk-Neutral Budget of Index Component i, as specified in the table below, if $RiskSignal_s = 1/2$, i.e. if the Risk Signal is "Risk-Neutral";
- The Risk-Off Budget of Index Component i, as specified in the table below, if $RiskSignal_s = 1$, i.e. if the Risk Signal is "Risk-Off";

i	Asset	Risk-Off Budget	Risk-Neutral Budget	Risk-On Budget
1	Swiss Equity	0%	8%	12%
2	US Equity	0%	8%	12%
3	European Equity	0%	4%	6%
4	Japanese Equity	0%	4%	6%
5	Emerging Market Equity	0%	3%	4%
6	US 10Y Treasuries	50%	30%	20%
7	European Treasuries	50%	30%	20%
8	Listed Real Estate	0%	5%	8%
9	Energy	0%	4%	6%
10	Gold	0%	4%	6%

5.3.3. Weight Calculation

In respect of any INDEX REBALANCING DAY, the weight of any Index Component i is calculated according to the following formula:

$$W_{i,t_{Reb}} = \frac{\frac{RB_{i,t_{Reb}}}{\sigma_{i,t_{Reb}}}}{\sum_{j=1}^{n} \frac{RB_{j,t_{Reb}}}{\sigma_{j,t_{Reb}}}}$$

Where:

$W_{i,t_{Reb}}$: Percentage Weight of Index Component i in the BASE INDEX as implemented on the INDEX REBALANCING DAY t_{Reb};

$RB_{i,t_{Reb}}$: The Risk Budget of Index Component i on the INDEX REBALANCING DAY t_{Reb};

$\sigma_{i,t_{Reb}}$: The volatility of Index Component i on the INDEX REBALANCING DAY t_{Reb};

$RB_{j,t_{Reb}}$: The Risk Budget of Index Component j on the INDEX REBALANCING DAY t_{Reb};

$\sigma_{j,t_{Reb}}$: The volatility of Index Component j on the INDEX REBALANCING DAY t_{Reb};

t_{Reb}: In respect on any CALCULATION DAY t, the INDEX REBALANCING DAY t_{Reb}, immediately preceding such CALCULATION DAY t.

5.4. ACCURACY

The level of the INDEX will be rounded to 2 decimal places when published.

5.5. 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/.

5.6. 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.

6. MISCELLANEOUS

6.1. 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.

6.2. 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.

6.3. 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 from the TRANSITION DATE (and including). 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.

6.4. 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/.

6.5. INDEX COMMITTEE

An index committee composed of staff from SOLACTIVE and its subsidiaries (the "**INDEX 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 INDEX 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/.

7. DEFINITIONS

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

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

"CALCULATION DAY" is any day:

(i) on which commercial banks and foreign exchange markets settle payments are open for general business in London and New York City;

(ii) on which each of the Chicago Mercantile Exchange, Eurex, the New York Stock Exchange (NYSE), the Osaka Securities Exchange and the Zurich Stock Exchange are scheduled to be open for trading;

(iii) which is a Funding Calculation Day in respect of all currencies CCY as specified in 4.5.1; and

(iv) which is a WMR Business Day.

"INDEX START DATE" 30 December, 2002.

"INITIAL CALCULATION DATE " January 4, 1999.

"EQUITY COMPONENT" Euro Stoxx 50 (Bloomberg Ticker: SX5E Index).

"CDS COMPONENT[8]" Markit iTraxx Europe Main Index as published by ICE (ICE Contract Symbol: ITRX EUR).

"SIGNAL CALCULATION DAY" is any day on which Eurex is scheduled to be open for trading, and on which a value for the EQUITY COMPONENT is published.

"INDEX REBALANCING DAY " The INDEX START DATE, and every Tuesday following the INDEX START DATE. If such day is not a CALCULATION DAY, then the first CALCULATION DAY following such day.

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

"DISRUPTED DAY" in respect to any CALCULATION DAY, where INDEX DISRUPTION EVENT has occurred or existing and subsisting.

"FUNDING CALCULATION DAY" In respect of any currency, as specified in 4.5.1 any day on which the Funding Rate is published by the relevant data provider or data source;

"FUNDING RATE SWITCH DATE 1" 3 January, 2022;

"FUNDING RATE SWITCH DATE 2" 3 July, 2023;

"FX RATE" : 4pm London time WM Fixing as quoted by Refinitiv.

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

[8] For the calculation of the Risk Signal (defined in section 5.2) on any Signal Calculation Day prior (and excluding) the TRANSITION DATE, CDS Component will refer to the Markit iTraxx Europe Index sourced from Composite Bloomberg Generic New York (Bloomberg Ticker: ITRXEBE CBGN Index). In respect of any SIGNAL CALCULATION DAY prior to the inception of the Markit iTraxx Europe Index on June 16, 2004, any reference to the CDS COMPONENT shall be deemed to refer to CS Euro Credit Default Swap Total Default Spread (Bloomberg Ticker: EUCDTODS Index)

"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 index components as described in 2.1.

"INDEX CURRENCY" is the currency specified in the column "Currency" in the table in Section 2.1.

"INDEX DISRUPTION EVENT" means a General Disruption Event, or any disruption with respect to an Index Component, as specified in its Index Component Rules.

"LOCAL TRADING DAY" in respect of Index Component i defined as Future Index in 2.1, any day that the financial market in which the relevant futures contract trades or is priced, is scheduled to be open for trading during its regular trading session and in respect of which a settlement price for such futures contract is scheduled to be published.

"FUTURE INDEX BUSINESS DAY" in respect of Index Component i defined as Future Index in 2.1, any day that is a Local Trading Day in respect of the Index Component i, and a London Business Day.

"ROLL DATE" In respect of an Index Component i defined as a Future Index in 2.1, the date falling the number of Future Index Business Days specified in the 'Roll' column in 4.2 prior to the Trigger Date of the relevant front month futures contract.

"TRIGGER DATE" In respect of a given futures contract, the earlier of such futures contract's last trading date and its first notice date.

"LAUNCH DATE" 15 December 2014.

"OVERSIGHT COMMITTEE" shall have the meaning as defined in Section 6.5.

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

"TRANSITION DATE" 11 September 2024.

"VOLATILITY CONTROL INDEX START DATE" 16 April, 2003. "VCISD" is the CALCULATION DAY corresponding to the start date of Volatility Controlled Index.

"WMR BUSINESS DAY" any day on which fixings are published at or around 4 P.M. London time by the WM Company / Reuters Currency Services;

8. HISTORY OF INDEX CHANGES

Version	Date	Description
1.1	*25 Apr 2025*	Index Guideline Clarification
1.0	*22 May 2024*	Index Guideline creation (*initial version*)

9. ANNEX A

9.1.1. OTC Option Price

The PRICE $PX_t^{Q_{m,t}^k}$ of OPTION $Q_{m,t}^k$ as of CALCULATION DAY t is calculated in accordance with the following formula:

- In relation to the any CALCULATION DAY t up to, and excluding, the Option Expiration Date m

$$PX_t^{Q_{m,t}^k} = BlackOptionPrice\left(OptionType, F_t^{Q_{m,t}^k}, r_t^{Q_{m,t}^k}, k, t, m, \sigma_t^{Q_{m,t}^k}\right)$$

- In relation to the Option Expiration Date m:

$$PX_t^{Q_{m,t}^k} = \begin{cases} max(0, k - S_m) & \text{if type of Option } Q_{m,t}^k \text{ is Put} \\ max(0, S_m - k) & \text{if type of Option } Q_{m,t}^k \text{ is Call} \end{cases}$$

With:

$BlackOptionPrice\left(OptionType, F_t^{Q_{m,t}^k}, r_t^{Q_{m,t}^k}, k, t, m, \sigma_t^{Q_{m,t}^k}\right)$: the BLACK OPTION PRICE of OPTION $Q_{m,t}^k$ as of CALCULATION DAY t as defined in Section 4.1.14

$\sigma_t^{Q_{m,t}^k}$: the Implied Volatility as of CALCULATION DAY t in relation to OPTION $Q_{m,t}^k$ as defined in Section 9.1.5.

$F_t^{Q_{m,t}^k}$: the Implied Forward as of CALCULATION DAY t in relation to OPTION $Q_{m,t}^k$ as defined in Section 9.1.6.

$r_t^{Q_{m,t}^k}$: the Discount Rate as of CALCULATION DAY t in relation to OPTION $Q_{m,t}^k$ as defined in Section 9.1.7.

Max: means the MAXIMUM FUNCTION

S_m: the UNDERLYING SETTLEMENT INDEX LEVEL as of EXPIRATION DATE m

k : the STRIKE PRICE of OPTION $Q_{m,t}^k$

m : the of EXPIRATION DATE of OPTION $Q_{m,t}^k$

9.1.2. Listed Option Implied Volatility

The Listed Option Implied Volatility in relation to a LISTED OPTION $O_{m,t}^{k}$ with strike k and maturity m on any CALCULATION DAY t is calculated as the implied volatility $\sigma_t^{O_{m,t}^{k}}$ for which the Black Price for such option matches the LISTED OPTION Mid Price:

$$Mid_t^{O_{m,t}^{k}} = BlackOptionPrice\left(OptionType, F_t^{O_{m,t}^{k}}, r_t^{O_{m,t}^{k}}, k, t, m, \sigma\right)$$

With:

$Mid_t^{O_m^k}$: The official settlement price of LISTED OPTION $O_{m,t}^{k}$ on CALCULATION DAY t

$BlackOptionPrice$: The Black Option Price Function as determined in accordance with Section 0

$OptionType$: The type of LISTED OPTION $O_{m,t}^{k}$, where type can be either Put or Call

$F_t^{O_{m,t}^{k}}$: IMPLIED FORWARD of LISTED OPTION $O_{m,t}^{k}$ as of CALCULATION DAY t.

$r_t^{O_{m,t}^{k}}$: The DISCOUNT RATE in relation to LISTED OPTION $O_{m,t}^{k}$ as of CALCULATION DAY t

If no such solution exists, then the Implied Volatility of the LISTED OPTION $O_{m,t}^{k}$ is set to the Implied Volatility of the LISTED OPTION with the next closest strike that is nearer to the EQUITY COMPONENT LEVEL.

The Listed Option Implied Volatility is rounded to 5 d.p

9.1.3. Option Universe

With respect to the interpolation of options, the following listed options are used (the LISTED OPTION UNIVERSE, and each a LISTED OPTION or OPTION CONTRACT):

- Weekly expiring options for interpolations on OTC Options on the EQUITY COMPONENT
- Monthly expiring options for interpolations on OTC Options on the EQUITY COMPONENT
- Only options where settlement prices exist are included
- With respect to options with a strike lower or equal to 80% of the EQUITY COMPONENT LEVEL with respect CALCULATION DAY t , only options where the strike is a multiple of 50 in OPTION CURRENCY will be selected
- With respect to CALCULATION DAY t, only options with maturities falling after CALCULATION DAY t are included
- Only options with maturities where an At-The-Money Strike can be identified
- Only options with maturities where at least two different strikes are available for each option type (Call or Put).

With respect to expiry dates where both a monthly and a weekly option expire, the weekly option will be selected.

9.1.4. Black Option Price

The Black Option Price is calculated in relation to any LISTED OPTION $O_{m,t}^{k}$ on any CALCULATION DAY t in accordance with the following formula:

$$BlackOptionPrice(Put, F, r, k, t, m, \sigma) = \exp(-r \times DCFT_{t,m}) \times \left(k \times IN(-d_2(F, r, k, t, m, \sigma)) - F \times IN(-d_1(F, r, k, t, m, \sigma))\right)$$

$$BlackOptionPrice(Call, F, r, k, t, m, \sigma) = \exp(-r \times DCFT_{t,m}) \times \left(F \times IN(d_1(F, r, k, t, m, \sigma)) - k \times IN(d_2(F, r, k, t, m, \sigma))\right)$$

- Where:

$$d_1(F, r, k, t, m, \sigma) = \frac{\log\left(\frac{F}{k}\right) + \frac{\sigma^2}{2} \times DCFT_{t,m}}{\sigma \times \sqrt{DCFT_{t,m}}}$$

and

$$d_2(F, r, k, t, m, \sigma) = d_1(F, r, k, t, m, \sigma) - \sigma \times \sqrt{DCFT_{t,m}}$$

With:

$BlackOptionPrice$: The Black Option Price Function as defined above;

k : the STRIKE PRICE of OPTION $O^k_{m,t}$;

m : the of EXPIRATION DATE of OPTION $O^k_{m,t}$;

r: The Discount Rate of OPTION $O^k_{m,t}$;

F: The Implied Forward Price of OPTION $O^k_{m,t}$;

t : The Time to Maturity of OPTION $O^k_{m,t}$;

σ: The Implied Volatility of OPTION $O^k_{m,t}$;

$DCFT_{t,m}$: The DAY COUNT FRACTION in respect to EXPIRATION DATE m of LISTED OPTION $O^k_{m,t}$ as of CALCULATION DAY t.

$\exp(.)$: EXPONENTIAL FUNCTION to the Basis of Euler's number e.

$IN(.)$: CUMULATIVE DISTRIBUTION FUNCTION of the Standard Normal Distribution

$\log(.)$: The NATURAL LOGARITHM FUNCTION

9.1.5. OTC Option Implied Volatility

The OTC Option Implied Volatility to be used in calculating the Skew Signal will be calculated using the following two-step approach:

- Step 1: Select the strikes and maturities of LISTED OPTIONS to be used for volatility interpolation
- Step 2: Where the strike of the OTC Option is not the strike of LISTED OPTION, the implied volatility of the OTC Option for such strike will be interpolated using the implied volatilities of the two LISTED OPTIONS with strikes closest to the strike of the OTC Option; and

- Step 3: Where the maturity of the OTC Option is not the maturity of a LISTED OPTION, the implied volatility of the OTC Option for such maturity will be interpolated from the implied volatilities of the two LISTED OPTIONS with maturities closest to the maturity of the OTC Option, using (if necessary) the implied volatility interpolated under step 2.

9.1.5.1. Selecting Listed Options for Interpolation

In order to calculate the OTC Option Implied Volatility, up to four listed options are required:

Maturity Selection

- Where the maturity of OTC Option $OTC_{m,t}^{k}$ is equal to the maturity of a LISTED OPTION, only one maturity is selected which is the same as the maturity of the OTC Option (i.e., m=m1=m2);
- Where the maturity of OTC Option $OTC_{m,t}^{k}$ is lower than any maturity of a LISTED OPTION, the two shortest maturities of LISTED OPTIONS will be selected (i.e., m < m1 < m2);
- Where the maturity of OTC Option $OTC_{m,t}^{k}$ is higher than any maturity of a LISTED OPTION, the two longest maturities of LISTED OPTIONS will be selected (i.e., m1 < m2 < m);
- Otherwise, the maturity of (i) the LISTED OPTIONS with the longest maturity less than the maturity m of the OTC Option (m1), and (ii) the LISTED OPTION with the shortest maturity greater than the maturity m of the OTC Option (m2) will be selected (i.e., m1<m<m2).

Strike Selection

- With respect to each selected maturity, the forward adjusted strike will be calculated in as follows:

$$\tilde{k} = k \times \frac{F_t^{O_{\tilde{m},t}^{k}}}{F_t^{OTC_{m,t}^{k}}}$$

- Where $\tilde{m}$ is the selected maturity:
  - Where the strike $\tilde{k}$ is equal to the strike of an option with maturity m within the Listed Option Universe, only one strike is selected which is the same as the strike k $(i.e., \tilde{k}_{UP} = \tilde{k}_{LOW})$
  - Otherwise, the closest two strikes of listed options with maturity $\tilde{m}$ within the Listed Option Universe ($\tilde{k}_{UP}$ and $\tilde{k}_{LOW}$) will be selected
  - For the second closest strike, in case two strikes are equidistant of $\tilde{k}$, interpolation will be prioritized, i.e the furthest of the two from the first closest strike will be selected.

And with:

$F_t^{O_{\tilde{m},t}^{k}}$: the IMPLIED FORWARD of Listed Option $O_{\tilde{m},t}^{k}$ with maturity $\tilde{m}$

$F_t^{OTC_{m,t}^{k}}$: the IMPLIED FORWARD of OTC Option $OTC_{m,t}^{k}$ with maturity m

k: The STRIKE PRICE of OTC Option $OTC_{m,t}^{k}$

The following rule shall be added to the Strike Selection:

- With respect to Put Option Contracts:
  - If $\tilde{k}_{UP} > \tilde{k}_{LOW}$ *and* $Mid_t^{O_{\tilde{m},t}^{\tilde{k}_{UP}}} < Mid_t^{O_{\tilde{m},t}^{\tilde{k}_{LOW}}}$ then:
    - If $Mid_t^{O_{\tilde{m},t}^{\tilde{k}_{LOW}}} \leq$ €0.5 then: $Mid_t^{OTC_{m,t}^{k}} = 0$, and $\sigma_t^{OTC_{m,t}^{k}} = 0$
    - Else: The option with the strike furthest away from shall be removed and the Strike Selection process repeated. In case such ATM spot level is equidistant from the two nearest strikes, the lowest strike will be removed.
- With respect to Call Option Contracts:
  - If $\tilde{k}_{UP} > \tilde{k}_{LOW}$ *and* $Mid_t^{O_{\tilde{m},t}^{\tilde{k}_{UP}}} > Mid_t^{O_{\tilde{m},t}^{\tilde{k}_{LOW}}}$ then:
    - If $Mid_t^{O_{\tilde{m},t}^{\tilde{k}_{UP}}} \leq$ €0.5 then: $Mid_t^{OTC_{m,t}^{k}} = 0$, and $\sigma_t^{OTC_{m,t}^{k}} = 0$
    - Else: The option with the strike furthest away from shall be removed and the Strike Selection process repeated. In case such ATM spot level is equidistant from the two nearest strikes, the highest strike will be removed.

9.1.5.2. Estimating the Implied Volatility for a given Maturity

In relation to each selected maturity $\tilde{m}$ and strike $\tilde{k}$, the volatility will be calculated as follow:

$$\sigma_t^{O_{\tilde{m},t}^{\tilde{k}}} = max\left[0;\ \frac{\tilde{k}_{UP} - \tilde{k}}{\tilde{k}_{UP} - \tilde{k}_{LOW}} \times \sigma_t^{O_{\tilde{m},t}^{\tilde{k}_{LOW}}} + \frac{\tilde{k} - \tilde{k}_{LOW}}{\tilde{k}_{UP} - \tilde{k}_{LOW}} \times \sigma_t^{O_{\tilde{m},t}^{\tilde{k}_{UP}}}\right]$$

9.1.5.3. Estimating the Implied Volatility of the OTC Option

From the previous section, the Implied Volatility of the selected Listed Options is now calculated with respect to maturities m1 and m2. The Implied Volatility of the OTC Option is then interpolated as follows:

$$\sigma_t^{OTC_{m,t}^{k}} = max\left[0;\ \frac{1}{\sqrt{DCFT_{t,m}}} \times \left(\frac{DCFT_{m,m2}}{DCFT_{m1,m2}} \times \sigma_t^{o_{m1,t}^{\tilde{k}}} \times \sqrt{DCFT_{t,m1}} + \frac{DCFT_{m1,m}}{DCFT_{m1,m2}}\ \sigma_t^{o_{m2,t}^{\tilde{k}}} \times \sqrt{DCFT_{t,m2}}\right)\right]$$

9.1.6. Implied Forward

9.1.6.1. Selecting Listed Options for Interpolation

In order to calculate the OTC Option Implied Forward, two maturities are required:

- Where the maturity of OTC Option $OTC_{m,t}^{k}$ is equal to the maturity of a Listed Option, only one maturity is selected which is the same as the maturity of the OTC Option (i.e., m=m1=m2

- Where the maturity of OTC Option $OTC_{m,t}^{k}$ is lower than any maturity of a Listed Option, the two shortest maturities of Listed Options will be selected (i.e., m < m1 < m2)
- Where the maturity of OTC Option $OTC_{m,t}^{k}$ is higher than any maturity of a Listed Option, the two longest maturities of Listed Options will be selected (i.e., m1 < m2 < m)
- Otherwise, the maturity of (i) the Listed Options with the longest maturity less than the maturity m of the OTC Option (m1), and (ii) the Listed Option with the shortest maturity greater than the maturity m of the OTC Option (m2) will be selected (i.e., m1<m<m2).

9.1.6.2. Estimating the Listed Option Implied Forward

The Implied Forward $F_t^{O_{m,t}^{k}}$ is calculated with respect to any LISTED OPTION $O_{m,t}^{k}$ on any CALCULATION DAY t according to the following formula:

$$F_t^{O_{m,t}^{k}} = \exp\left(r_t^{O_{m,t}^{k}} \times DCFT_{t,m}\right)\left[Mid_t^{C_{m,t}^{ATM}} - Mid_t^{P_{m,t}^{ATM}}\right] + ATMK_t^{O_{m,t}^{k}}$$

With:

$F_t^{O_{m,t}^{k}}$: IMPLIED FORWARD of LISTED OPTION $O_{m,t}^{k}$ as of CALCULATION DAY t.

$r_t^{O_{m,t}^{k}}$: The DISCOUNT RATE in relation to LISTED OPTION $O_{m,t}^{k}$ as of CALCULATION DAY t

$Mid_t^{C_{m,t}^{ATM}}$: The MID PRICE of the Call Option Contract $C_{m,t}^{ATM}$ as of CALCULATION DAY t

$C_{m,t}^{ATM}$: The Call Option Contract with EXPIRATION DATE m and Strike Price $ATMK_t^{O_{m,t}^{k}}$ as of CALCULATION DAY t

$Mid_t^{P_{m,t}^{ATM}}$: The MID PRICE of the Put Option Contract $P_{m,t}^{ATM}$ as of CALCULATION DAY t

$P_{m,t}^{ATM}$: The Put Option Contract with EXPIRATION DATE m and Strike Price $ATMK_t^{O_{m,t}^{k}}$ as of CALCULATION DAY t

$ATMK_t^{O_{m,t}^{k}}$: AT-The-Money Strike with respect to LISTED OPTION $O_{m,t}^{k}$ on CALCULATION DAY t, which is the strike closes to the ATM spot level of the EQUITY COMPONENT. In case such ATM Spot level is equidistant from the two nearest strikes, the lowest strike will be selected.

9.1.6.3. Estimating the OTC Option Implied Forward

The OTC Option Implied Forward $F_t^{OTC_{m,t}^{k}}$ to be used to interpolate the OTC option prices will be calculated as follows:

- Where the maturity of OTC Option is equal to the maturity of a LISTED OPTION:

$$F_t^{OTC_{m,t}^{k}} = F_t^{O_{m,t}^{k}}$$

- Else:

$$F_t^{OTC_{m,t}^k} = F_t^{O_{m1,t}^k} + \left(F_t^{O_{m2,t}^k} - F_t^{O_{m1,t}^k}\right) \times \frac{DCFT_{m1,m}}{DCFT_{m1,m2}}$$

With:

$F_t^{O_{m1,t}^k}$: The Implied Forward of a LISTED OPTION $O_{m1,t}^k$ with maturity $m1$

$m1$: The maturity of LISTED OPTION $O_{m1,t}^k$ being the LISTED OPTION with the longest maturity less than the maturity of Option $OTC_{m,t}^k$ on CALCULATION DAY t

$F_t^{O_{m2,t}^k}$: The Implied Forward of a LISTED OPTION $O_{m2,t}^k$ with maturity $m2$

$m2$: The maturity of LISTED OPTION $O_{m2,t}^k$ being the LISTED OPTION with the shortest maturity greater than the maturity of Option $OTC_{m,t}^k$ on CALCULATION DAY t

$DCFT_{m1,m}$: The number of CALENDAR DAYS from (and including) EXPIRATION DATE $m1$ to (and excluding) EXPIRATION DATE m *divided by* 365.

$DCFT_{m1,m2}$: The number of CALENDAR DAYS from (and including) EXPIRATION DATE $m1$ to (and excluding) EXPIRATION DATE $m2$ *divided by* 365.

9.1.7. Discount Rate

The Discount Rate $r_t^{OTC_{m,t}^k}$ to be used to interpolate OTC option prices on any CALCULATION DAY t is calculated as follows:

$$r_t^{OTC_{m,t}^k} = r_{t-1}$$

Where:

r_{t-1}: The Rate in the currency in which the relevant EQUITY COMPONENT is denominated as of the CALCULATION DAY immediately preceding CALCULATION DAY t (or if such rate is not available the immediately preceding rate)

With:

Currency	Rate	Rate RIC
EUR	Euro short-term rate (€STR)	EUROSTR=

9.1.8. Day Count Fraction

The DAY COUNT FRACTION $DCFT_{t,m}$ in respect of EXPIRATION DATE m as of CALCULATION DAY t is (i) the number of CALENDAR DAYS from (and including) CALCULATION DAY t to (and excluding) EXPIRATION DATE m *divided by* (ii) 365.

10. ANNEX DEFINITIONS

"**LISTED OPTION**" shall have the meaning as defined in Section 9.1.4.

"MID PRICE" shall mean the settlement price available on the primary exchange on which the relevant option is listed during regular trading hours.

"NATURAL LOGARITHM FUNCTION" is the inverse of the EXPONENTIAL FUNCTION.

"OPTION" means an OTC (Over the counter) derivative that securitizes the right but not the obligation to buy (an option of type Call) or sell (an option of type Put) a pre-defined reference instrument relating to a position in respect of the EQUITY COMPONENT at a pre-defined day, the EXPIRATION DATE m, for a pre-defined price, the STRIKE PRICE K.

"OPTION CURRENCY" is the currency denomination of the EQUITY COMPONENT, "EUR".

"STRIKE PRICE" is defined in relation to an OPTION.

"EQUITY COMPONENT LEVEL" in relation to a CALCULATION DAY t means the official close of the EQUITY COMPONENT on that day

"EQUITY COMPONENT SETTLEMENT LEVEL" in relation to a CALCULATION DAY t means the official close of the EQUITY COMPONENT on that day

"DAY COUNT FRACTION" has the meaning given to it in Section 9.1.8

"EXPIRATION DATE" is defined in relation to an OPTION.

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