INDEX GUIDELINE

HSBC US Equity Income Intraday Index
HSBC US Equity Income Intraday 5 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 following two indices: (i) HSBC US Equity Income Intraday Index (the "**INDEX**"), and (ii) HSBC US Equity Income Intraday 5 Index (the "**LEVERAGED INDEX**"). Any amendments to the rules made to the GUIDELINE are approved by the INDEX COMMITTEE specified in Section 5.5. Each of the INDEX and LEVERAGED 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**"). The name "Solactive" is trademarked.

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opinion of The INDEX ADMINISTRATOR regarding a possible investment in a financial instrument based on the INDEX and LEVERAGED INDEX.

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

1. INDEX SPECIFICATIONS

1.1. SCOPE OF THE INDEX AND LEVERAGED INDEX

Category	Description
Asset Class	Equity
Strategy	The INDEX is a rules-based strategy that aims to track the performance of a portfolio of short-dated S&P 500 Index put options sold on a daily basis[1]. The INDEX notionally enters into a short position in respect of five put options with a delta of 2%, with each option having a different expiration date. The options comprised in the portfolio are delta hedged on an intraday basis four times a day. The INDEX is calculated on a notional basis. The investment exposure provided by the INDEX to the options referenced in the INDEX is purely synthetic and an investor in the INDEX will have no rights in respect of any such options. For the avoidance of doubt, any reference herein to options being "entered into" is purely on a notional basis. The LEVERAGED INDEX is a leveraged version of the INDEX and is also calculated on a notional basis. The methodology in respect of the LEVERAGED INDEX is set out in Section 4.3.
Regional Allocation	North America

Table 1 Index Overview

1.2. IDENTIFIERS AND PUBLICATION

The INDEX and LEVERAGED INDEX are published under the following identifiers:

Name	ISIN	Index Currency	Type	BBG ticker	RIC
HSBC US Equity Income Intraday Index	DE000SL0NRT1	USD	Excess Return	HSIEP2II Index	.HSIEP2II
HSBC US Equity Income Intraday 5 Index	DE000SL0PRR0	USD	Excess Return	HSIEP5II Index	.HSIEP5II
HSBC US Equity Income Intraday Indicative Index	DE000SL0RR12	USD	Excess Return	HSIOP2II Index	.HSIOP2II
HSBC US Equity Income Intraday 5 Indicative Index	DE000SL0RR38	USD	Excess Return	HSIOP5II Index	.HSIOP5II

Each of the INDEX and LEVERAGED 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

[1] Prior to the TRANSITION DATE, the put options were sold three times a week.

individual basis as to whether it will distribute or display the INDEX and LEVERAGED INDEX via its information systems.

Any publication in relation to the INDEX and LEVERAGED 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 AND LEVERAGED INDEX

The initial level of the INDEX and LEVERAGED INDEX on the START DATE is 100. Historical values from 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 using exchange prices. Levels of the INDEX published for the period falling prior to 1st August 2022 have been provided by the INDEX OWNER to the INDEX ADMINISTRATOR. The INDEX OWNER has obtained the listed options available from REFINITIV and calculated the levels of the INDEX for the period of START DATE to LIVE DATE.

1.4. PRICES AND CALCULATION FREQUENCY

The level of the HSBC US EQUITY INCOME INTRADAY INDEX and HSBC US EQUITY INCOME INTRADAY 5 INDEX is calculated in respect of each CALCULATION DAY t and is published at 09:00 a.m. CET on the CALCULATION DAY immediately following CALCULATION DAY t. The level of the HSBC US EQUITY INCOME INTRADAY INDICATIVE INDEX and HSBC US EQUITY INCOME INTRADAY 5 INDICATIVE INDEX is calculated in respect of each CALCULATION DAY t and is published at 05:00 p.m. EST on the CALCULATION DAY t.

1.5. LICENSING

Licenses to use the INDEX and LEVERAGED 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 the INDEX OWNER.

2. THE INDEX: INDEX SELECTION

2.1. SELECTION OF INDEX COMPONENTS

On each CALCULATION DAY t that is an EXPIRATION DATE in respect of a LISTED OPTION but not a HALF TRADING DAY, a synthetic portfolio of several OPTIONS is notionally traded in connection with the INDEX.

The parameters of the INDEX are defined below in: "*Table 2: Index Parameters*":

PARAMETER	GUIDELINES NOTATION	HSIESGU1
UNDERLYING INDEX		SPX Index
LISTED OPTIONS		S&P 500 Weekly Options
DELTA HEDGE FEE	dhf	0.01%
FRICTION	f	$0.0007\% \times S_{t-1}$

Table 2: Index Parameters

The characteristics of the traded OPTIONS differ depending upon the CALCULATION DAY t in respect of which notional trading occurs:

(a) Effective up to, but excluding, the TRANSITION DATE, the characteristics of traded OPTIONS are defined below in: "*Table 3: Old Options' Characteristics*";

(b) Effective from, and including, the TRANSITION DATE, the characteristics of traded OPTIONS are defined below in: "*Table 4: New Options' Characteristics*".

OPTION NAME	GUIDELINES NOTATION	$P1_t$	$P2_t$	$P3_t$
TRADE DATE	TD_O	CALCULATION DAY t		
EXPIRATION DATE	TE_O	$\mathrm{M1_t}$	$\mathrm{M2_t}$	$\mathrm{M3_t}$
UNWIND DATE	TU_O	$\mathrm{M1_t}$	$\mathrm{M2_t}$	$\mathrm{M3_t}$
NUMBER OF UNITS	$Units_{t,O}$	$-\frac{Index_{t-1}^{TR}}{S_{t-1}} \times 120\% \times \frac{3}{2}$	$-\frac{Index_{t-1}^{TR}}{S_{t-1}} \times \frac{60\%}{2} \times \frac{3}{2}$	$-\frac{Index_{t-1}^{TR}}{S_{t-1}} \times \frac{20\%}{3} \times \frac{3}{2}$
STRIKE	K_O	$K1_t$	$K2_t$	$K3_t$

Table 3: Old Options' Characteristics

OPTION NAME	GUIDELINES NOTATION	$P1_t$	$P2_t$	$P3_t$	$P4_t$	$P5_t$
TRADE DATE	TD_O	CALCULATION DAY t				
EXPIRATION DATE	TE_O	$M1_t$	$M2_t$	$M3_t$	$M4_t$	$M5_t$
UNWIND DATE	TU_O	$M1_t$	$M2_t$	$M3_t$	$M4_t$	$M5_t$
NUMBER OF UNITS	$Units_{t,O}$	$-\frac{Index_{t-1}^{TR}}{S_{t-1}} \times 60\% \times \frac{3}{2}$	$-\frac{Index_{t-1}^{TR}}{S_{t-1}} \times \frac{60\%}{2} \times \frac{3}{2}$	$-\frac{Index_{t-1}^{TR}}{S_{t-1}} \times \frac{40\%}{3} \times \frac{3}{2}$	$-\frac{Index_{t-1}^{TR}}{S_{t-1}} \times \frac{20\%}{4} \times \frac{3}{2}$	$-\frac{Index_{t-1}^{TR}}{S_{t-1}} \times \frac{20\%}{5} \times \frac{3}{2}$
STRIKE PRICE	K_O	$K1_t$	$K2_t$	$K3_t$	$K4_t$	$K5_t$

Table 4: New Options' Characteristics

With:

Mi_t: for each i from 1 to 5, means the i-th ELIGIBLE LISTED EXPIRATION DATE falling after CALCULATION DAY t, provided that for the purposes of day counting any date that is not a CALCULATION DAY shall be excluded from the counting process.

$Index_{t-1}^{TR}$: the TOTAL RETURN LEVEL of the INDEX as computed in Section4.1

S_{t-1}: the closing level of the UNDERLYING INDEX on CALCULATION DAY t-1.

Ki_t: for each i from 1 to 5, means the ELIGIBLE LISTED STRIKE with EXPIRATION DATE Mi_t which is the closest to KAi_t

KAi_t: for each i from 1 to 5 means the adjusted STRIKE PRICE for PUT OPTION Pi_t and computed on CALCULATION DAY t according to the following formula:

$$KAi_t = KTi_{t-1} \times \frac{SI_t}{SE_{t-1}} + \min\left(0, -d2_{t-1}^{Mi_t, KTi_{t-1}, \sigma(t-1, KTi_{t-1}, Mi_t), Fwd(t-1, Mi_t)} \times KTi_{t-1} \times 0.01 \times (VIXI_t - VIXE_{t-1}) \times sqrt\left(\frac{30}{365}\right)\right) + \frac{KTi_{t-1} \times \sigma(t-1, KTi_{t-1}, Mi_t)}{252\sqrt{DCF(t-1, Mi_t)}} \times \frac{d2_{t-1}^{Mi_t, KTi_{t-1}, \sigma(t-1, KTi_{t-1}, Mi_t), Fwd(t-1, Mi_t)}}{2}$$

KTi_{t-1}: for each i from 1 to 5, means the target STRIKE PRICE for Option Pi_t, computed on CALCULATION DAY t-1, calculated such that the DELTA as defined in Section 4.2.4 of such PUT OPTION is equal to -2% (with the following boundaries $70\% \times S_{t-1}$ and S_{t-1})

SI_t: the TWAP LAST of the UNDERLYING INDEX as of CALCULATION DAY t over the window specified in Table 10: "*Cash Indices Intraday TWAP Window*" in Section 2.4

$VIXI_t$: the TWAP LAST of the VIX INDEX as of CALCULATION DAY t over the window specified in Table 10: "*Cash Indices Intraday TWAP Window*" in Section 2.4

SE_t: the TWAP LAST of the UNDERLYING INDEX as of CALCULATION DAY t over the window specified in Table 9: "*Options TWAP Window"* in 2.4

$VIXE_t$: the TWAP LAST of the VIX INDEX as of CALCULATION DAY t over the window specified in Table 9: "*Options TWAP Window"* in Section 2.4

$\sigma(t-1, KTi_{t-1}, Mi_t)$: the IMPLIED VOLATILITY as of CALCULATION DAY t-1 in relation to STRIKE PRICE KTi_{t-1} as of EXPIRATION DATE Mi_t as defined in Section 4.2.10

$d2_{t-1}^{Mi_t, KTi_{t-1}, \sigma(t-1, KTi_{t-1}, Mi_t), Fwd(t-1, Mi_t)}$: computed according to the following formula, as of CALCULATION DAY t-1 in relation to STRIKE PRICE KTi_{t-1} , EXPIRATION DATE Mi_t, IMPLIED VOLATILITY $\sigma(t-1, KTi_{t-1}, Mi_t)$ and FORWARD $Fwd(t-1, Mi_t)$ as defined in Section 4.2.9

$$d2_t^{T,K,\sigma,Fwd} = \frac{\log\left(\frac{Fwd}{K}\right) - \frac{\sigma^2}{2} \times DCF_{t,T}}{\sigma \times \sqrt{DCF_{t,T}}}$$

$Fwd(t-1, Mi_t)$: the FORWARD as of CALCULATION DAY t-1, in relation to EXPIRATION DATE Mi_t and computed according to Section 4.2.9

$DCF(t, Mi_t)$: means DAY COUNT FRACTION, in respect of EXPIRATION DATE Mi_t as of CALCULATION DAY t, computed as (i) the number of CALCULATION DAYS from (and including) CALCULATION DAY t to (and excluding) EXPIRATION DATE Mi_t and (ii) divided by 252

2.2. SELECTION OF THE ELIGIBLE LISTED OPTIONS

2.2.1. Filtering of Eligible Listed Options

On any CALCULATION DAY t, a LISTED OPTION is an "**ELIGIBLE LISTED OPTION**" if (i) its STRIKE PRICE is an ELIGIBLE LISTED STRIKE, and (ii) its EXPIRATION DATE is an ELIGIBLE LISTED EXPIRATION DATE, as defined below:

1. A **"ELIGIBLE LISTED EXPIRATION DATE"** means an EXPIRATION DATE in respect of a LISTED OPTION where the following condition is satisfied: There are not less than two corresponding listed STRIKE PRICES with BID PRICES and ASK PRICES for both CALL OPTIONS and PUT OPTIONS, where the BID PRICES are lower than or equal to the corresponding ASK PRICES.
2. An "**ELIGIBLE LISTED STRIKE**" means a STRIKE PRICE in respect of a LISTED OPTION where the following condition is satisfied: The OPTION has a BID PRICE and an ASK PRICE, where the BID PRICE is lower than or equal to the ASK PRICE.

2.2.2. Listed Options Bid/Ask Prices

On any CALCULATION DAY t in respect of the Options TWAP Window:

1. The "**LISTED BID PRICE**" for each available LISTED OPTION is the TWAP Bid[2] in respect of such OPTION, as such term is defined in Section 2.4., and
2. The "**LISTED ASK PRICE**" for each available LISTED OPTION is the TWAP Ask[3] in respect of such OPTION, as such term is defined in Section 2.4
3. The "**LISTED MID PRICE**" for each available LISTED OPTION is the TWAP Mid[4] in respect of such OPTION, as such term is defined in Section 2.4

This Section 2.2.2 is subject to the proviso that if, on any CALCULATION DAY *t*, the STRIKE PRICE of an OPTION comprised in the portfolio is not an ELIGIBLE LISTED STRIKE, such OPTION'S ASK PRICE, BID PRICE or MID PRICE (as appropriate) is computed according to Section 4.2.2 using (1) an IMPLIED VOLATILITY determined in accordance with Section 4.2.10 using LISTED ASK PRICE, LISTED BID PRICE or LISTED MID PRICE (as appropriate), and (2) a FORWARD and a DISCOUNT FACTOR determined in accordance with Section 4.2.6 and 4.2.8 using LISTED MID PRICES.

2.3. SELECTION OF THE HEDGE INSTRUMENT

On any CALCULATION DAY t, the HEDGE INSTRUMENT is the closest to expire FUTURE CONTRACT of the Futures Chain, unless the EXPIRATION DATE of such closest to expire FUTURE CONTRACT is less than five CALCULATION DAYS after CALCULATION DAY t, in which case the HEDGE INSTRUMENT is the second closest to expire FUTURE CONTRACT.

Futures Chain is the set of FUTURE CONTRACTS that are related to a specific exchange and specific UNDERLYING ASSET.

[2] Provided that prior to the LIVE DATE, the end of day valuation EXCHANGE BID PRICE was used, and not the TWAP Bid.
[3] Provided that prior to the LIVE DATE, the end of day valuation EXCHANGE ASK PRICE was used, and not the TWAP Ask.
[4] Provided that prior to the LIVE DATE, the average of the end of day valuation EXCHANGE BID PRICE and end of day valuation EXCHANGE ASK PRICE was used, and not the TWAP Mid.

The "Futures Chain" is identified in the column entitled "Futures Chain RIC" in the below table:

Futures Chain RIC	Exchange MIC	Future Currency	Price Definition
0#ES:	XCME	USD	TWAP

Table 6: Futures Chain Parameters

2.4. TWAP CALCULATION METHODOLOGY

This Section 2.4 sets out the calculation methodology for time weighted average prices with respect to OPTIONS and the HEDGE INSTRUMENT, such prices comprising each of the TWAP BID, TWAP ASK, TWAP MID and TWAP LAST.

The tables below define the "**Start Time**" and "**End Time**" of each of the Observations Periods and Execution Periods that are used to compute the TWAP BID, TWAP ASK, TWAP MID and TWAP LAST.

All hours follow those of the New York Stock Exchange time zone (EST time).

Observation Period i	Start Time	End Time	Bucket Size
$i = 1$	9:30	9:35	1 second[5]
$i = 2$	11:30	11:35	
$i = 3$	13:30	13:35	
$i = 4$	15:30	15:35	

Table 7: Intraday Hedge Observation Windows

Execution Period i	Start Time	End Time	Bucket Size
$i = 1$	9:50	10:00	1 second[5]
$i = 2$	11:50	12:00	
$i = 3$	13:50	14:00	
$i = 4$	15:50	16:00	

Table 8: Intraday Hedge Execution Windows

Start Time	End Time	Bucket Size
15:50[6]	16:00[7]	1 second

Table 9: Options TWAP Window

Start Time	End Time	Bucket Size
15:30	15:35	1 second

Table 10: Cash Indices Intraday TWAP Window

TWAP MID, TWAP BID, TWAP ASK, TWAP LAST

"**TWAP MID**" is defined as the time weighted average mid price on a given second s over a window of n seconds, calculated in accordance with the following formula:

[5] Prior to the LIVE DATE, the Bucket Size was 1 minute.

[6] On a Calculation Day that is a Half Trading Day, the Options TWAP Window Start Time shall be 12:50 EST.

[7] On a Calculation Day that is a Half Trading Day, the Options TWAP Window End Time shall be 13:00 EST.

$$TWAP_s^n(Mid) = \frac{TWAP_s^n(Bid)+TWAP_s^n(Ask)}{2}$$

Where:

$TWAP_s^n(Bid)$ = TWAP BID as defined below

$TWAP_s^n(Ask)$ = TWAP ASK as defined below

"**TWAP BID**" is defined as the time weighted average bid price on a given second s over a window of n seconds, calculated in accordance with the following formula:

$$TWAP_s^n(Bid) = \frac{1}{n'}\sum_{i=0}^{n-1} Bid(s-i)$$

Where:

- $\mathrm{Bid}(t)$ is the prevailing EXCHANGE BID PRICE of a Valid Quote at time t or, if no Valid Quote is observed at this time, zero;
- n': represents the number of Valid Quotes in the interval in which the average is computed.
- "Valid Quote": An EXCHANGE BID PRICE/EXCHANGE ASK PRICE quote is deemed to be a Valid Quote if both EXCHANGE BID PRICE and EXCHANGE ASK PRICE are non-null, with (i) the EXCHANGE ASK PRICE being greater than or equal to the EXCHANGE BID PRICE, and (ii) the EXCHANGE BID PRICE being above zero.

"**TWAP ASK**" is defined as the time weighted average ask price on a given second s over a window of n seconds, calculated in accordance with the following formula:

$$TWAP_s^n(Ask) = \frac{1}{n'}\sum_{i=0}^{n-1} Ask(s-i)$$

Where:

- $\mathrm{Ask}(t)$ is the prevailing EXCHANGE ASK PRICE of the Valid Quote at time t or, if no Valid Quote is observed at this time, zero;
- n': represents the number of Valid Quotes in the interval in which the average is computed.
- "Valid Quote": An EXCHANGE BID PRICE/EXCHANGE ASK PRICE quote is deemed to be a Valid Quote if both EXCHANGE BID PRICE and EXCHANGE ASK PRICE are non-null, with (i) the EXCHANGE ASK PRICE being greater than or equal to the EXCHANGE BID PRICE, and (ii) the EXCHANGE BID PRICE being above zero.

"**TWAP LAST**" is defined as the time weighted average ask price on a given second s over a window of n seconds, calculated in accordance with the following formula:

$$TWAP_s^n(Last) = \frac{1}{n}\sum_{i=0}^{n-1} Last(s-i)$$

Where:

- $\text{Last}(t)$ is the prevailing EXCHANGE LAST PRICE at time t
- n: represents the number of EXCHANGE LAST PRICE quotes in the interval in which the average is computed.

3. REBALANCE OF THE INDEX

3.1. ORDINARY REBALANCE

No ordinary rebalance takes place with respect to the INDEX.

3.2. EXTRAORDINARY REBALANCE

No extraordinary rebalance takes place with respect to the INDEX.

4. CALCULATION OF THE INDEX AND LEVERAGED INDEX

4.1. THE INDEX: INDEX FORMULA

The "**EXCESS RETURN LEVEL**" of the INDEX $Index_t^{ER}$ is calculated in accordance with the following formula:

- In relation to START DATE t_0:

$$Index_{t_0}^{ER} = 100$$

- On each following CALCULATION DAY t:

$$Index_t^{ER} = Index_{t-1}^{ER} + Index_t^{TR} - Index_{t-1}^{TR} \times (1 + ON_{t-1} \times \frac{Act(t-1,t)}{360})$$

The "**TOTAL RETURN LEVEL**" of the INDEX $Index_t^{TR}$ is calculated in accordance with the following formula:

- In relation to START DATE t_0:

$$Index_{t_0}^{TR} = 100$$

- On each following CALCULATION DAY t:

$$Index_t^{TR} = PortfolioMtM_t + Cash_t$$

Where:

$Index_t^{TR}$: means the TOTAL RETURN LEVEL of the INDEX on CALCULATION DAY t

$Index_{t-1}^{TR}$: means the TOTAL RETURN LEVEL of the INDEX on CALCULATION DAY t-1

$Index_t^{ER}$: means the EXCESS RETURN LEVEL of the INDEX on CALCULATION DAY t

$Index_{t-1}^{ER}$: means the EXCESS RETURN LEVEL of the INDEX on CALCULATION DAY t-1

ON_{t-1} : Overnight rate (SOFRRATE Index, provided that prior to 2 April 2018 FEDL01 Index is used) level on CALCULATION DAY t-1 (or, if such a rate is not available, the immediately preceding rate)

$Act(t-1,t)$: means the number of calendar days from, and including, CALCULATION DAY t-1 to, but excluding, the CALCULATION DAY t

$PortfolioMtM_t$: means the PORTFOLIO MARK-TO-MARKET in respect of CALCULATION DAY t

$Cash_t$: means the CASH AMOUNT in respect of CALCULATION DAY t

4.1.1. Portfolio Mark-To-Market

In relation to CALCULATION DAY t, the PORTFOLIO MARK-TO-MARKET $PortfolioMtM_t$ is calculated in accordance with the following formula:

$$PortfolioMtM_t = \sum_{\substack{O \in COP_t \\ TU_O > t \text{ AND } TE_O > t}} Units_O \times Mid_{t,O}$$

Where:

COP_t: each OPTION O comprising the CONTINUING OPTION PORTFOLIO in respect of CALCULATION DAY t, as described in Section 4.1.2.

$Units_O$: the NUMBER OF UNITS in respect of OPTION O as defined in Section 2.1.

$Mid_{t,O}$: the MID PRICE of OPTION O in respect of CALCULATION DAY t

TU_O : the UNWIND DATE of OPTION O as defined in Section 2.1.

TE_O : the EXPIRATION DATE of OPTION O as defined in Section 2.1.

4.1.2. Continuing Option Portfolio

In relation to CALCULATION DAY t, the CONTINUING OPTION PORTFOLIO COP_t is the set comprising of each OPTION O that satisfies the following criteria:

- TRADE DATE (TR_O) in respect of OPTION O falls on or prior to CALCULATION DAY t
- EXPIRATION DATE (TE_O) in respect of OPTION O falls after CALCULATION DAY t
- UNWIND DATE (TU_O) in respect of OPTION O falls after CALCULATION DAY t

4.1.3. Cash Amount

The CASH AMOUNT $Cash_t$ is calculated in accordance with the following formula:

- In relation to START DATE t_0:

$$Cash_{t_0} = 100$$

- On each following CALCULATION DAY t:

$$Cash_t = Cash_{t-1} \times \left(1 + ON_{t-1} \times \frac{ACT_{t-1,t}}{360}\right) - PR_t + EV_t + UV_t + DHV_t - DHF_t$$

Where:

PR_t: the PREMIUM PAID in respect of CALCULATION DAY t

EV_t: the EXERCISE VALUES in respect of CALCULATION DAY t

UV_t: the UNWIND VALUES in respect of CALCULATION DAY t

DHV_t: the DELTA HEDGE VALUES in respect of CALCULATION DAY t

DHF_t: the DELTA HEDGE FEE in respect of CALCULATION DAY t

ON_{t-1}: the Overnight rate (SORFRATE Index) level as of the CALCULATION DAY t-1 (or, if such a rate is not available, the immediately preceding rate)

$ACT_{t-1,t}$: the number of calendar days from, and including, CALCULATION DAY t-1 to, but excluding CALCULATION DAY t

4.1.4. Premium Paid

In relation to CALCULATION DAY t, the PREMIUM PAID PR_t is calculated in accordance with the following formula:

$$PR_t = \sum_{O \in COP_t \; AND \; TR_O = t} P_{O,t}$$

with

$$P_{O,t} = \begin{cases} Units_{TR_O,O} \times Max(0, Ask_{t,O} + f), & if \; Units_{TR_O,O} > 0 \\ Units_{TR_O,O} \times Max(0, Bid_{t,O} - f), & if \; Units_{TR_O,O} < 0 \end{cases}$$

Where:

COP_t : each OPTION O comprising the CONTINUING OPTION PORTFOLIO in respect of CALCULATION DAY t, as described in Section 4.1.2.

$Units_{TR_O,O}$: the NUMBER OF UNITS in respect of OPTION O as defined in Section 2.1

TR_O : the TRADE DATE of OPTION O as defined in Section 2.1

$Ask_{t,O}$: the ASK PRICE of OPTION O in respect of CALCULATION DAY t

$Bid_{t,O}$: the BID PRICE of OPTION O in respect of CALCULATION DAY t

$sign(x)$: 1 if $x > 0$ otherwise -1

f : the FRICTION as defined in Section 2.1.

$Vega_{t,O}$: the VEGA of OPTION O in respect of CALCULATION DAY t as defined in Section 4.2.4

4.1.5. Exercise Values

In relation to CALCULATION DAY t, the EXERCISE VALUES EV_t is calculated in accordance with the following formula:

$$EV_t = \sum_{O \in COP_{t-1} \; AND \; TE_O = t} Units_{TR_O,O} \times Payoff_{t,O}$$

Where:

$Units_{TR_O,O}$: the NUMBER OF UNITS in respect of OPTION O traded on TRADE DATE TR_O

$Payoff_{t,O}$: the PAYOUT of OPTION O as of CALCULATION DAY t, as defined in Section 4.2.1.

4.1.6. Unwind Values

In relation to CALCULATION DAY t, the UNWIND VALUES UV_t is calculated in accordance with the following formula:

$$UV_t = \sum_{O \in COP_t \ AND \ TU_O = t \ AND \ TE_O > t} UV_{O,t}$$

With

$$UV_{O,t} = \begin{cases} Units_{TR_O,O} \times Max(0, Bid_{t,O} - f), & if \ Units_{TR_O,O} > 0 \\ Units_{TR_O,O} \times Max(0, Ask_{t,O} + f), & if \ Units_{TR_O,O} < 0 \end{cases}$$

Where:

$Units_{TR_O,O}$: the NUMBER OF UNITS in respect of OPTION O traded on TRADE DATE TR_O

$Ask_{t,O}$: the ASK PRICE of OPTION O in respect of CALCULATION DAY t

$Bid_{t,O}$: the BID PRICE of OPTION O in respect of CALCULATION DAY t

f : the FRICTION as defined in Section 2.1

$Vega_{t,O}$: the VEGA of OPTION O in respect of CALCULATION DAY t

4.1.7. Delta Hedge Values

In relation to CALCULATION DAY t, the DELTA HEDGE VALUES DHV_t is calculated in accordance with the following formula:

$$DHV_t = \sum_{O \in COP_{t-1} \ AND \ TE_O \geq t} ODHV_{O,t}$$

Where:

COP_t : each OPTION O comprising the CONTINUING OPTION PORTFOLIO in respect of CALCULATION DAY t as defined in Section 4.1.2

TE_O : the EXPIRATION DATE of OPTION O as defined in Section 2.1

$ODHV_{O,t}$: the DELTA HEDGE VALUE of OPTION O as of CALCULATION DAY t and is calculated according to the following formula:

$$ODHV_{O,t} = \sum_{i=1}^{M} IDHV_{O,t,i}$$

Where:

M : is the number of Execution Periods as defined in Section 2.4

$IDHV_{O,t,i}$: the intraday DELTA HEDGE VALUE of OPTION O as of CALCULATION DAY t for the i-th Execution Period such that $1 \leq i \leq M$ and is computed according to the following formula:

$$IDHV_{O,t,i} = -nb_{O,t,i-1} \times (Fut_{t,i}^{exec} - Fut_{t,i-1}^{exec})$$

Where:

$Fut_{t,i}^{exec}$: the TWAP MID of the HEDGE INSTRUMENT (as defined in Section 2.4) as of CALCULATION DAY t for Execution Period i

$Fut_{t,i-1}^{exec}$: the TWAP MID of the HEDGE INSTRUMENT (as defined in Section 2.4) as of CALCULATION DAY t for Execution Period $i-1$ such that $1 < i \leq M$. Otherwise, if $i = 1$, then $Fut_{t,0}^{exec} = Fut_{t-1,M}^{exec}$

$nb_{O,t,i-1}$: the NUMBER OF UNITS of the HEDGE INSTRUMENT held on CALCULATION DAY t right before the i-th Execution Period and defined as the following:

For $2 \leq i \leq M$:

$$nb_{O,t,i-1} = Units_{TR_O,O} \times delta\left(t-1, O, \sigma_{O,t-1}, Fwd_{t-1,TE_O} \times \frac{Fut_{t,i-1}^{obs}}{Fut_{t-1,M}^{exec}}\right) \times \frac{Fwd_{t-1,TE_O}}{Fut_{t-1,M}^{exec}}$$

For $i = 1$:

$$nb_{O,t,0} = nb_{O,t-1,M} = Units_{TR_O,O} \times delta(t-1, O, \sigma_{O,t-2}, Fwd_{t-2,TE_O} \times \frac{Fut_{t-1,M}^{obs}}{Fut_{t-2,M}^{exec}}) \times \frac{Fwd_{t-2,TE_O}}{Fut_{t-2,M}^{exec}}$$

Where:

Fwd_{t-1,TE_O} : the FORWARD of EXPIRATION DATE TE_O computed on CALCULATION DAY t-1 according to Section 4.2.9

$\sigma_{O,t-1}$: the IMPLIED VOLATILITY of OPTION O computed on CALCULATION DAY t-1 according to Section 4.2.10.

$Fut_{t,i}^{obs}$: the TWAP MID of the HEDGE INSTRUMENT (as defined in Section 2.3) as of CALCULATION DAY t for Observation Period i such that $1 \leq i \leq M$.

4.1.8. Delta Hedge Fee

In relation to CALCULATION DAY t, the DELTA HEDGE VALUES DHV_t is calculated in accordance with the following formula:

$$DHF_t = IDHF_{t-1,M} + \sum_{i=1}^{M-1} IDHF_{t,i}$$

Where:

M : is the number of Execution Periods as defined in Section 2.4

$IDHF_{t,i}$: the intraday DELTA HEDGE FEE as of CALCULATION DAY t for the i-th Execution Period and is computed according to the following formula:

For $1 \leq i \leq M-1$:

$$DHF_{t,i} = Fut_{t,i}^{exec} \times dhf \times abs\left(\sum_{O\epsilon\ COP_{t-1}} nb_{O,t,i} - nb_{O,t,i-1}\right)$$

$$DHF_{t,1} = Fut_{t,1}^{exec} \times dhf \times abs\left(\sum_{O\epsilon\ COP_{t-1}} nb_{O,t,1}\right) + Fut_{t,1}^{exec,Front\ month} \times dhf \times abs\left(\sum_{O\epsilon\ COP_{t-1}} -nb_{O,t,0}\right) \text{ when } t = Rolling\ Future\ Date$$

For $i = M$:

$$DHF_{t,M} = Fut_{t,M}^{exec} \times dhf \times abs\left(\sum_{\substack{O\epsilon\ COP_{t-1} \\ AND\ TE_O>t \\ AND\ TU_O>t}} (nb_{O,t,M} - nb_{O,t,M-1}) + \sum_{\substack{O\epsilon\ COP_{t-1} \\ AND\ (TE_O=t\ OR\ TU_O=t)}} -nb_{O,t,M-1} + \sum_{\substack{O\epsilon\ COP_t \\ AND\ TR_O=t}} nb_{O,t,M}\right)$$

Where:

dhf : is the DELTA HEDGE FEE as defined in Section 2.1

$Fut_{t,i}^{exec}$: the TWAP MID of the HEDGE INSTRUMENT (as defined in Section 2.4) as of CALCULATION DAY t on the i-th Execution Period

$nb_{O,t,i-1}$: the NUMBER OF UNITS of the HEDGE INSTRUMENT held on CALCULATION DAY t right before the i-th Execution Period as defined in Section 4.1.8

COP_t : each OPTION O comprising the CONTINUING OPTION PORTFOLIO in respect of CALCULATION DAY t as defined in Section 4.1.2

TE_O : the EXPIRATION DATE of OPTION O as defined in Section 2.1

TR_O : the TRADE DATE of OPTION O as defined in Section 2.1

TU_O : the UNWIND DATE of OPTION O as defined in Section 2.1

$Rolling\ Future\ Date$: as defined in Section 2.1

$Fut_{t,i}^{exec,Front\ month}$: the TWAP MID of the closest to expire FUTURE CONTRACT of the *Futures Chain* (as defined in Section 2.3) as of CALCULATION DAY t on the i-th Execution Period

4.2. THE INDEX: OPTION PRICING METHODOLOGY

4.2.1. Payoff

In relation to OPTION O, the PAYOUT $Payoff_{t,O}$ is calculated in accordance with the following formula:

$$Payoff_{O,t} = max(0, CP \times (USI_t - K_O))$$

Where:

CP : whether the OPTION O is OPTION TYPE Call ($CP = 1$) or OPTION TYPE Put ($CP = -1$)

Max: means the MAXIMUM FUNCTION

USI_t: the UNDERLYING CLOSING INDEX LEVEL as of CALCULATION DAY t

K_O : the STRIKE PRICE of OPTION O

4.2.2. Premium

In relation to OPTION O, the PREMIUM $PX_{t,O}$ as of CALCULATION DAY t is calculated in accordance with the following formula:

$$\begin{aligned} PX_{t,O} &= PX\left(t, CP, Fwd_{t,TE_O}, DF_{t,TE_O}, TE_O, K_O, \sigma_{t,K_O,TE_O}\right) \\ &= DF_{t,TE_O} \times CP \\ &\times \left(Fwd_{t,TE_O} \times N\left(CP \times d_{1,K_O,TE_O,t}\left(\sigma_{t,K_O,TE_O}\right)\right) - K_O \times N\left(CP \times d_{2,K_O,TE_O,t}\left(\sigma_{t,K_O,TE_O}\right)\right)\right) \end{aligned}$$

- Where:

$$d_{1,K,TE,t}(\sigma) = \frac{\log\left(\frac{Fwd_{t,TE}}{K}\right) + \frac{\sigma^2}{2} \times DCF_{t,TE}}{\sigma \times \sqrt{DCF_{t,TE}}}$$

and

$$d_{2,K,TE,t}(\sigma) = d_{1,K,TE,t}(\sigma) - \sigma \times \sqrt{DCF_{t,TE}}$$

With:

Fwd_{t,TE_O}: the FORWARD in relation to CALCULATION DAY t and EXPIRATION DATE TE_O as calculated in accordance with Section 4.2.8

DF_{t,TE_O}: the DISCOUNT FACTOR in relation to CALCULATION DAY t and EXPIRATION DATE TE_O as calculated in accordance with Section 4.2.6

σ_{t,K_O,TE_O}: the IMPLIED VOLATILITY σ as of CALCULATION DAY t in relation to STRIKE PRICE K_O of OPTION O and EXPIRATION DATE TE_O as calculated in accordance with Section 4.2.10.

$DCF_{t,TE}$: the DAY COUNT FRACTION in respect to EXPIRATION DATE TE as of CALCULATION DAY t as defined in Section 4.2.5

K_O : the STRIKE PRICE of OPTION O

TE_O: the EXPIRATION DATE of OPTION O

$N(x)$: CUMULATIVE DISTRIBUTION FUNCTION of the Standard Normal Distribution, being a value computed according to the following formula:

$$N(x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{x} e^{-\frac{u^2}{2}} du$$

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

4.2.3. Eligible Listed Option Implied Volatility

The ELIGIBLE LISTED OPTION IMPLIED VOLATILITY in relation to an ELIGIBLE LISTED OPTION O with STRIKE PRICE K and EXPIRATION DATE TE on any CALCULATION DAY t is calculated as the IMPLIED VOLATILITY σ for which the PREMIUM for such OPTION matches the price of the ELIGIBLE LISTED OPTION (LISTED BID PRICE, LISTED ASK PRICE, or LISTED MID PRICE):

$$Price_{t,O}^{TE,K} = PX_{t,O} = PX\left(CP, Fwd_{t,TE}, DF_{t,TE}, K, t, TE, \sigma\right)$$

With:

$Price_{t,O}^{TE,K}$: is either the LISTED BID PRICE, LISTED ASK PRICE or LISTED MID PRICE in respect of CALCULATION DAY t of the ELIGIBLE LISTED OPTION O expiring on EXPIRATION DATE TE with a STRIKE PRICE K

$PX_{t,O}$: The PREMIUM of OPTION O as of CALCULATION DAY t as determined in accordance with Section 4.2.2.

CP: The OPTION TYPE of ELIGIBLE LISTED OPTION O expiring on EXPIRATION DATE TE with a STRIKE PRICE K

$Fwd_{t,TE}$: the FORWARD in relation to CALCULATION DAY t and EXPIRATION DATE TE

$DF_{t,TE}$: the DISCOUNT FACTOR in relation to CALCULATION DAY t and EXPIRATION DATE TE

4.2.4. Option Greeks Calculation

The DELTA, VEGA, GAMMA, and THETA of any OPTION O are computed in accordance with the following formulas:

The DELTA $Delta_{t,O}$ of OPTION O as of CALCULATION DAY t is calculated as follows:

$$\begin{aligned} Delta_{t,O} &= Delta\left(t, CP, Fwd_{t,TE_O}, DF_{t,TE_O}, TE_O, K_O, \sigma_{t,K_O,TE_O}\right) \\ &= DF_{t,TE_O} \times CP \times N\left(CP \times d_{1,O,t}\left(\sigma_{t,K,TE_O}\right)\right) \end{aligned}$$

The VEGA $Vega_{t,O}$ of OPTION O as of CALCULATION DAY t is calculated as follows:

$$\begin{aligned} Vega_{t,O} &= Vega\left(t, CP, Fwd_{t,TE_O}, DF_{t,TE_O}, TE_O, K_O, \sigma_{t,K_O,TE_O}\right) \\ &= DF_{t,TE_O} \times Fwd_{t,TE_O} \times N'(d_{1,O,t}\left(\sigma_{t,K_O,TE_O}\right)) \times \sqrt{DCF_{t,TE_O}} \end{aligned}$$

The GAMMA $Gamma_{t,O}$ of OPTION O as of CALCULATION DAY t is calculated as follows:

$$\begin{aligned} Gamma_{t,O} &= Gamma\left(t, CP, Fwd_{t,TE_O}, DF_{t,TE_O}, TE_O, K_O, \sigma_{t,K_O,TE_O}\right) \\ &= \frac{N'(d_{1,O,t}\left(\sigma_{t,K_O,TE_O}\right)) \times DF_{t,TE_O}}{Fwd_{t,TE_O} \times \sigma_{t,K_O,TE_O} \times \sqrt{DCF_{t,TE_O}}} \end{aligned}$$

The THETA $Theta_{t,O}$ of OPTION O as of CALCULATION DAY t is calculated as follows:

$$Theta_{t,O} = Theta\left(t, CP, Fwd_{t,TE_O}, DF_{t,TE_O}, TE_O, K_O, \sigma_{t,K_O,TE_O}\right)$$
$$= -\frac{N'\left(d_{1,O,t}\left(\sigma_{t,K_O,TE_O}\right)\right) \times DF_{t,TE_O} \times Fwd_{t,TE_O} \times \sigma_{t,K_O,TE_O}}{2 \times \sqrt{DCF_{t,TE_O}}}$$
$$+ \frac{\ln\left(DF_{t,TE_O}\right) \times CP}{DCF_{t,TE_O}}$$
$$\times \left[K_O \times DF_{t,TE_O} \times N\left(CP \times d_{2,K_O,TE_O,t}\left(\sigma_{t,K_O,TE_O}\right)\right)\right.$$
$$\left. - Fwd_{t,TE_O} \times DF_{t,TE_O} \times N\left(CP \times d_{1,K_O,TE_O,t}\left(\sigma_{t,K_O,TE_O}\right)\right)\right]$$

Where:

$$d_{1,O,t}(K) = \frac{\log\left(\frac{Fwd_{t,TE_O}}{K}\right) + \frac{{\sigma_{t,K,TE_O}}^2}{2} \times DCF_{t,TE_O}}{\sigma_{t,K,TE_O} \times \sqrt{DCF_{t,TE_O}}}$$

With:

CP : whether the OPTION O is OPTION TYPE Call ($CP = 1$) or OPTION TYPE Put ($CP = -1$)

DF_{t,TE_O}: the DISCOUNT FACTOR in respect to EXPIRATION DATE TE_O of OPTION O as of CALCULATION DAY t

Fwd_{t,TE_O}: FORWARD in respect to EXPIRATION DATE TE_O of OPTION O as of CALCULATION DAY t

K: The STRIKE PRICE of OPTION O

DCF_{t,TE_O}: The DAY COUNT FRACTION in respect to EXPIRATION DATE TE_O of OPTION O as of CALCULATION DAY t as defined in Section 4.2.5

$N(x)$: CUMULATIVE DISTRIBUTION FUNCTION of the Standard Normal Distribution, being a value computed according to the following formula:

$$N(x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{x} e^{-\frac{u^2}{2}} du$$

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

σ_{t,K,TE_O}: the IMPLIED VOLATILITY as of CALCULATION DAY t in relation to STRIKE PRICE K as of EXPIRATION DATE TE_O of OPTION O

$\mathrm{N}'(x)$: the density function of the Standard Normal Distribution, being a value computed according to the following formula:

$$N'(x) = \frac{e^{-\frac{x^2}{2}}}{\sqrt{2\pi}}$$

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

4.2.5. Day Count Fraction

The DAY COUNT FRACTION in respect of EXPIRATION DATE TE as of CALCULATION DAY t is (i) the number of CALCULATION DAYS from (and including) CALCULATION DAY t to (but excluding) EXPIRATION DATE TE *divided by* (ii) 252.

4.2.6. Discount Factor

In relation to CALCULATION DAY t and EXPIRATION DATE TE, the DISCOUNT FACTOR $DF_{t,TE}$ is calculated as follows:

$$DF_{t,TE} = \exp\left(\log\left(DF_{t,T_1}\right) + \frac{DC_{T_1,TE} \times \left(\log\left(DF_{t,T_2}\right) - \log\left(DF_{t,T_1}\right)\right)}{DC_{T_1,T_2}}\right)$$

With:

T_1: means the ELIGIBLE LISTED EXPIRATION DATE T_1 selected in accordance with Section 4.2.7

T_2: means the ELIGIBLE LISTED EXPIRATION DATE T_2 selected in accordance with Section 4.2.7

DF_{t,T_1}: the DISCOUNT FACTOR in relation to CALCULATION DAY t and ELIGIBLE LISTED EXPIRATION DATE T_1 calculated in accordance with Section 4.2.9. If $T_1 = t$, then the DISCOUNT FACTOR in relation to CALCULATION DAY t and ELIGIBLE LISTED EXPIRATION DATE T_1 is 1.

DF_{t,T_2}: the DISCOUNT FACTOR in relation to CALCULATION DAY t and ELIGIBLE LISTED EXPIRATION DATE T_2 calculated in accordance with Section 4.2.9

$DC_{T_1,TE}$: means the NUMBER OF CALENDAR DAYS in the period commencing on (and including) ELIGIBLE LISTED EXPIRATION DATE T_1 and ending on (but excluding) EXPIRATION DATE TE.

DC_{T_1,T_2}: means the NUMBER OF CALENDAR DAYS in the period commencing on (and including) ELIGIBLE LISTED EXPIRATION DATE T_1 and ending on (but excluding) ELIGIBLE LISTED EXPIRATION DATE T_2.

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

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

4.2.7. Maturity Selection

In relation to CALCULATION DAY t and EXPIRATION DATE TE, two EXPIRATION DATES T_1, T_2 are selected with regards to TE following the below methodology:

- Where EXPIRATION DATE TE is lower than any EXPIRATION DATE within the set of ELIGIBLE LISTED EXPIRATION DATES, $T_1 = t$ and T_2 is the shortest ELIGIBLE LISTED EXPIRATION DATE in respect of CALCULATION DAY t.
- Where EXPIRATION DATE TE is strictly greater than any EXPIRATION DATE within the set of ELIGIBLE LISTED EXPIRATION DATES, $T_1 = T_2 = TE$.
- Otherwise, (i) T_1 is the furthest ELIGIBLE LISTED EXPIRATION DATE in respect of CALCULATION DAY t that is less than or equal to TE, and (ii) T_2 is the shortest ELIGIBLE LISTED EXPIRATION DATE in respect of CALCULATION DAY t that is greater than or equal to TE.

-

4.2.8. Forward

In relation to CALCULATION DAY t and EXPIRATION DATE TE, the FORWARD $Fwd_{t,TE}$ is calculated as follows:

$$Fwd_{t,TE} = \exp\left(\log\left(Fwd_{t,T_1}\right) + \frac{DC_{T_1,TE} \times \left(\log\left(Fwd_{t,T_2}\right) - \log\left(Fwd_{t,T_1}\right)\right)}{DC_{T_1,T_2}}\right)$$

With:

T_1: means the ELIGIBLE LISTED EXPIRATION DATE T_1 selected in accordance with Section 4.2.7

T_2: means the ELIGIBLE LISTED EXPIRATION DATE T_2 selected in accordance with Section 4.2.7

Fwd_{t,T_1}: the FORWARD in relation to CALCULATION DAY t and EXPIRATION DATE T_1 calculated in accordance with Section 4.2.9. If $T_1 = t$, then the FORWARD in relation to CALCULATION DAY t and EXPIRATION DATE T_1 is the UNDERLYING CLOSING INDEX LEVEL as of CALCULATION DAY t

Fwd_{t,T_2}: the FORWARD in relation to CALCULATION DAY t and EXPIRATION DATE T_2 calculated in accordance with Section 4.2.9

DC_{T_1,T_2}: means the NUMBER OF CALENDAR DAYS in the period commencing on (and including) ELIGIBLE LISTED EXPIRATION DATE T_1 and ending on (but excluding) ELIGIBLE LISTED EXPIRATION DATE T_2

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

4.2.9. Discount Factor and Forward for an Eligible Listed Expiration Date

In relation to CALCULATION DAY t, for an EXPIRATION DATE of an ELIGIBLE LISTED OPTION, the DISCOUNT FACTOR and FORWARD for that EXPIRATION DATE shall be calculated in accordance with the following methodology:

- DISCOUNT FACTOR (DF_i) equals 1 for all ELIGIBLE LISTED EXPIRATION DATES; and
- FORWARD (F_i) equals the TWAP MID[8] of the UNDERLYING INDEX computed over the window specified in Table 9: *"Options TWAP Window"* in Section 2.4

4.2.10. Implied Volatility

In relation to CALCULATION DAY t, STRIKE PRICE K and EXPIRATION DATE TE, the IMPLIED VOLATILITY $\sigma_{t,K,TE}$ is calculated based on the following methodology:

In order to calculate the IMPLIED VOLATILITY, up to four LISTED OPTIONS are required.

In relation to CALCULATION DAY t and EXPIRATION DATE TE, two EXPIRATION DATES T_1, T_2 are selected in accordance with Section 4.2.7

The DISCOUNT FACTOR and FORWARD for the two selected EXPIRATION DATES are calculated in accordance with Section 4.2.9

With respect to each selected ELIGIBLE LISTED EXPIRATION DATE T_i, two STRIKE PRICES K_1, and K_2 are selected using the following criteria:

[8] Provided that prior to the LIVE DATE, the UNDERLYING INDEX CLOSING LEVEL was used

- Where STRIKE PRICE K is strictly lower than the lowest STRIKE PRICE of ELIGIBLE LISTED OPTION in respect of CALCULATION DAY t and EXPIRATION DATE T_i , $K_2 = K_1$, where K_1 is lowest STRIKE PRICE of ELIGIBLE LISTED OPTION in respect of CALCULATION DAY t and EXPIRATION DATE T_i
- Where STRIKE PRICE K is strictly higher than the highest STRIKE PRICE of ELIGIBLE LISTED OPTION in respect of CALCULATION DAY t and EXPIRATION DATE T_i , $K_1 = K_2$, where K_2 is the highest STRIKE PRICE of ELIGIBLE LISTED OPTION in respect of CALCULATION DAY t and EXPIRATION DATE T_i
- Otherwise, (i) K_1 is the highest STRIKE PRICE of ELIGIBLE LISTED OPTION in respect of CALCULATION DAY t and EXPIRATION DATE $T_i$that is less than or equal to STRIKE PRICE K, and (ii) K_2 is the lowest STRIKE PRICE of ELIGIBLE LISTED OPTION in respect of CALCULATION DAY t and EXPIRATION DATE T_i that is higher than or equal to STRIKE PRICE K

The four selected ELIGIBLE LISTED OPTIONS are set to be of OPTION TYPE Put.

Once the DISCOUNT FACTOR, FORWARD, EXPIRATION DATE and STRIKE PRICE are determined for the four selected ELIGIBLE LISTED OPTIONS, the IMPLIED VOLATILITY of each such OPTION is determined in accordance with Section 4.2.3, namely:

σ_{t,K_1,T_1} , σ_{t,K_2,T_1} , σ_{t,K_1,T_2} , σ_{t,K_2,T_2}.

The IMPLIED VOLATILITY for the ELIGIBLE LISTED OPTION with STRIKE PRICE K and for the two selected ELIGIBLE LISTED EXPIRATION DATE T_1, T_2 is thus interpolated as follows:

$$\sigma_{t,K,T_1} = \begin{cases} \sigma_{t,K_1,T_1} + \dfrac{(K-K_1)\times\left(\sigma_{t,K_2,T_1}-\sigma_{t,K_1,T_1}\right)}{(K_2-K_1)} & if\ K_1 \neq K_2 \\ \sigma_{t,K_1,T_1} & otherwise \end{cases}$$

$$\sigma_{t,K,T_2} = \begin{cases} \sigma_{t,K_1,T_2} + \dfrac{(K-K_1)\times\left(\sigma_{t,K_2,T_2}-\sigma_{t,K_1,T_2}\right)}{(K_2-K_1)} & if\ K_1 \neq K_2 \\ \sigma_{t,K_1,T_2} & otherwise \end{cases}$$

Finally, the IMPLIED VOLATILITY $\sigma_{t,K,TE}$ in relation to CALCULATION DAY t, STRIKE PRICE K and EXPIRATION DATE TE is calculated as follows:

$$\sigma_{t,K,TE} = \begin{cases} \sqrt{\dfrac{1}{DC_{t,TE}} \times Max\left(0, \left(\sigma_{t,K,T_1}\right)^2 \times DC_{t,T_1} + \dfrac{DC_{T_1,TE} \times \left[\left(\sigma_{t,K,T_2}\right)^2 \times DC_{t,T_2} - \left(\sigma_{t,K,T_1}\right)^2 \times DC_{t,T_1}\right]}{DC_{T_1,T_2}}\right)} & if\ T_1 \neq T_2 \\ \sigma_{t,K,T_1} & otherwise \end{cases}$$

With:

σ_{t,K,T_1}: means the IMPLIED VOLATILITY in respect of Calculation Day t with EXPIRATION DATE T_1 being an ELIGIBLE LISTED EXPIRATION DATE

σ_{t,K,T_2}: means the IMPLIED VOLATILITY in respect of CALCULATION DAY t with EXPIRATION DATE T_2 being an ELIGIBLE LISTED EXPIRATION DATE

DC_{t,T_1}: means the number of CALCULATION DAYS in the period commencing on (and including) CALCULATION DAY t and ending on (but excluding) ELIGIBLE LISTED EXPIRATION DATE T_1

DC_{t,T_2}: means the number of CALCULATION DAYS in the period commencing on (and including) CALCULATION DAY t and ending on (but excluding) ELIGIBLE LISTED EXPIRATION DATE T_2

$DC_{T_1,TE}$: means the number of CALCULATION DAYS in the period commencing on (and including) ELIGIBLE LISTED EXPIRATION DATE T_1 and ending on (but excluding) EXPIRATION DATE TE

$DC_{T_2,TE}$: means the number of CALCULATION DAYS in the period commencing on (and including) ELIGIBLE LISTED EXPIRATION DATE T_2 and ending on (but excluding) EXPIRATION DATE TE

4.3. THE LEVERAGED INDEX

4.3.1. Leveraged Index Formula

Terms used below shall have the meaning given to them in this Section 4.3 or otherwise elsewhere in this GUIDELINE.

The HSBC US Equity Income Intraday 5 Index is the "**LEVERAGED INDEX**".

The "**LEVERAGED LEVEL**" in respect of the LEVERAGED INDEX on CALCULATION DAY t ($Index_t^{Lev}$) is calculated in accordance with the following formula:

On the START DATE t_0:

$$Index_{t_0}^{Lev} = 100$$

On each CALCULATION DAY t following the START DATE:

$$Index_t^{Lev} = LevUnits_{t-1} \times Index_t^{ER} + CashAdj_t$$

4.3.2. Index and Leveraged Index

$Index_t^{ER}$: means the EXCESS RETURN LEVEL of the INDEX on CALCULATION DAY t as defined in Section 4.1

$Index_t^{Lev}$: means the LEVERAGED LEVEL of the LEVERAGED INDEX on CALCULATION DAY t

4.3.3. Cash Adjustment

$CashAdj_t$: means the CASH ADJUSTMENT on CALCULATION DAY t, and is defined as the following:

In relation to START DATE t_0 and the CALCULATION DAY immediately following START DATE (t_1):

$$CashAdj_{t0} = CashAdj_{t1} = -233$$

On each following CALCULATION DAY t:

$$CashAdj_t = CashAdj_{t-1} - (LevUnits_{t-1} - LevUnits_{t-2}) \times Index_{t-1}^{ER} - LevCost_t$$

4.3.4. Leverage Number of Units

$LevUnits_t$: means the "LEVERAGE NUMBER OF UNITS" of the INDEX in respect of CALCULATION DAY t, and is defined as the following:

On the START DATE t_0:

$$LevUnits_{t0} = w \times \frac{Index_{t0}^{Lev}}{Index_{t0}^{ER}}$$

On each CALCULATION DAY t following the START DATE which is a LEVERAGE REBALANCING DAY:

$$LevUnits_{t} = w \times \frac{Index_{t-1}^{Lev}}{Index_{t-1}^{ER}}$$

On each CALCULATION DAY t following the START DATE which is not a LEVERAGE REBALANCING DAY:

$$LevUnits_{t} = LevUnits_{t-1}$$

Where:

"**LEVERAGE REBALANCING DAY**": means the last CALCULATION DAY t falling in each calendar month.

w: means 333%

4.3.5. Leverage Execution Cost

$LevCost_t$: means the leverage execution cost in respect of CALCULATION DAY t, and is defined as the following:

$$LevCost_t = Abs(LevUnits_t - LevUnits_{t-1}) \times Index_t^{ER} \times LevTC$$

$LevTC$: means the leverage transaction cost, being 0.05%

$Abs(x)$: means the absolute value of number x

4.3.6. Negative Value

The LEVERAGED LEVEL of the LEVERAGED INDEX is not subject to a minimum of zero and may be a negative value.

In the event that on any CALCULATION DAY t, the LEVERAGED LEVEL in respect of the LEVERAGED INDEX falls to zero or below, such LEVERAGED INDEX shall on such CALCULATION DAY t set the LEVERAGE NUMBER OF UNITS of the INDEX to zero and no further changes in LEVERAGE NUMBER OF UNITS shall occur thereafter.

4.3.7. General

Unless otherwise defined in this Section 4.3, for any CALCULATION DAY t, and for any integer j:

tj refers to the CALCULATION DAY that is j CALCULATION DAYS following CALCULATION DAY t

t-j refers to the CALCULATION DAY that is j CALCULATION DAYS preceding CALCULATION DAY t

4.4. ACCURACY

The level of the INDEX and LEVERAGED INDEX will be rounded to 4 decimal places.

4.5. RECALCULATION

The INDEX ADMINISTRATOR makes the greatest possible efforts to accurately calculate and maintain the INDEX and LEVERAGED INDEX. However, errors in the determination process may occur from time to

time for a variety of reasons (internal or external) and therefore cannot be completely ruled out in respect of the INDEX and LEVERAGED INDEX. The INDEX ADMINISTRATOR 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 generally depend 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/.

4.6. MARKET DISRUPTION

In periods of market stress the INDEX ADMINISTRATOR shall calculate the INDEX or LEVERAGED INDEX 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 or LEVERAGED INDEX may be limited or impaired at times of illiquid or fragmented markets and market stress.

5. MISCELLANEOUS

5.1. DISCRETION

Any discretion which may need to be exercised in relation to the determination of the INDEX or LEVERAGED 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 or LEVERAGED INDEX) shall be made in accordance with strict rules regarding the exercise of discretion or expert judgement by the INDEX ADMINISTRATOR.

5.2. METHODOLOGY REVIEW

The methodology of the INDEX and LEVERAGED INDEX is subject to regular review, at least annually. If 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 and LEVERAGED INDEX or 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 "Announcements", which is available at https://www.solactive.com/news/announcements/. The date of the last amendment of this INDEX is contained in this GUIDELINE.

5.3. 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 and LEVERAGED 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 LEVERAGED INDEX and the method applied to calculate the INDEX and LEVERAGED 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.

5.4. TERMINATION

The INDEX ADMINISTRATOR makes the greatest possible efforts to ensure the resilience and continued integrity of its indices over time. Where necessary, the INDEX ADMINISTRATOR shall follow a clearly defined and transparent procedure to adapt INDEX and LEVERAGED INDEX methodologies to account for 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 or LEVERAGED 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 or LEVERAGED INDEX, their index rules, and particularly the selection criteria, can no longer be applied coherently or the INDEX or LEVERAGED INDEX is no longer used as the underlying value for financial instruments, investment funds and financial contracts.

The INDEX ADMINISTRATOR 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/.

5.5. INDEX COMMITTEE

An index committee composed of staff from the INDEX ADMINISTRATOR and its subsidiaries (the "**INDEX COMMITTEE**") is responsible for decisions regarding any amendments to the rules of the INDEX and LEVERAGED 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/.

6. DEFINITIONS

"**ASK PRICE**" in relation to a CALCULATION DAY t and OPTION O, shall mean (i) the LISTED ASK PRICE, if the OPTION O is an ELIGIBLE LISTED OPTION calculated in accordance with Section 2.2.2; or (ii) otherwise, the price estimated in accordance with Section 4.2.2.

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

"**BID PRICE**" in relation to a CALCULATION DAY t and OPTION O, shall mean (i) the LISTED BID PRICE, if the OPTION O is an ELIGIBLE LISTED OPTION calculated in accordance with Section 2.2.2; or (ii) otherwise, the price estimated in accordance with Section 4.2.2.

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

"CALCULATION DAY" means a weekday on which each of NYSE and CBOE are open for business.

"CASH AMOUNT" shall have the meaning as defined in Section 4.1.3.

"CUMULATIVE DISTRIBUTION FUNCTION" defines the standard normal distribution.

"CONTINUING OPTION PORTFOLIO" has the meaning given to it in Section 4.1.2.

"DAY COUNT FRACTION" has the meaning given to it in Section 4.2.5

"DELTA" shall have the meaning given to it in Section 4.2.4

"DISCOUNT FACTOR" has the meaning given to it in Section 4.2.6

"ELIGIBLE LISTED EXPIRATION DATE" shall have the meaning given to it in Section 2.2.1

"ELIGIBLE LISTED OPTION" has the meaning given to it in Section 2.2.1.

"ELIGIBLE LISTED STRIKE" has the meaning given to it in Section 2.2.1.

"EXCHANGE" means any of the New York Stock Exchange ("**NYSE**") or the Chicago Board Options Exchange ("**CBOE**").

"EXCHANGE ASK PRICE" of an OPTION or HEDGE INSTRUMENT means the ask price sourced from the relevant exchange.

"EXCHANGE BID PRICE" of an OPTION or HEDGE INSTRUMENT means the bid price sourced from the relevant exchange.

"EXCHANGE LAST PRICE" of an index means the last price sourced from the relevant exchange.

"EXPIRATION DATE" is defined in relation to an OPTION, FUTURE CONTRACT or FORWARD and is the date on which such instrument expires.

"EXPONENTIAL FUNCTION" means the exponential function to the basis of Euler's Number e.

"FORWARD" has the meaning given to it in Section 4.2.8.

"FRICTION" is defined in relation to an OPTION and has the meaning given to it in Section2.1.

"FUTURE CONTRACT" means a listed futures contract in respect of the UNDERLYING ASSET.

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

"HALF TRADING DAY" means a CALCULATION DAY on which an early market close is announced by the relevant Exchange.

"HEDGE INSTRUMENT" has the meaning given to it in Section 2.3

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

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

"**INDEX COMMITTEE**" shall have the meaning as defined in Section 5.5

"**INDEX COMPONENTS**" means, with respect to the INDEX and a Calculation Day, all the OPTIONS in the CONTINUING OPTION PORTFOLIO on such day.

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

"IMPLIED VOLATILITY" has the meaning given to it in Section 4.2.10

"**LISTED OPTION**" means an OPTION that is listed on an EXCHANGE.

"**LIVE DATE**" means 13th March 2024.

"MAXIMUM FUNCTION" means, when followed by a series of amounts inside brackets, whichever is the larger of the amounts separated by a comma inside those brackets.

"MID PRICE" in relation to a CALCULATION DAY t and OPTION O, shall mean (i) the LISTED MID PRICE, if the OPTION O is an ELIGIBLE LISTED OPTION calculated in accordance with Section 2.2.2; or (ii) otherwise, the price estimated in accordance with Section 4.2.2.

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

"NUMBER OF UNITS" is defined in relation to an OPTION and is the quantity or number of OPTIONS.

"OPTION" means a derivative that securitizes the right but not the obligation to buy (being OPTION TYPE Call or a "**CALL OPTION**") or sell (being OPTION TYPE Put or a "**PUT OPTION**") a pre-defined reference instrument relating to a position in respect of the UNDERLYING ASSET, on a pre-defined day (being EXPIRATION DATE TE), for a pre-defined price (being STRIKE PRICE K).

"**OPTION TYPE**" shall mean the type of OPTION O, which can be either "Call" or "Put".

"PAYOUT" has the meaning given to it in Section 4.2.1.

"PORTFOLIO MARK-TO-MARKET" has the meaning given to it in Section 4.1.1.

"PREMIUM" has the meaning given to it in Section 4.2.2.

"PREMIUM PAID" has the meaning given to it in Section 4.1.4.

"**REFINITIV**" is a data provider being a subsidiary of London Stock Exchange.

"**ROLLING FUTURE DATE**" is a Calculation Day that is five Calculation Days prior to the EXPIRATION DATE of the closest FUTURE CONTRACT to expire.

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

"START DATE" means 3rd January 2017.

"STRIKE PRICE" is defined in relation to an OPTION and is the strike price specified in respect of such OPTION.

"TRADE DATE" means, in relation to an OPTION O, the CALCULATION DAY t on which the position in respect of such OPTION is notionally traded.

"TRANSITION DATE" means 12th May 2022.

"**UNDERLYING ASSET"** or **"SPX INDEX"**" means the S&P 500 Index.

"UNDERLYING INDEX CLOSING LEVEL" in relation to a CALCULATION DAY t means the official close of the **UNDERLYING ASSET** on that day, identified by its RIC .SPX.

"UNWIND DATE" is defined in relation to an OPTION and is the date on which such OPTION unwinds.

"UNWIND VALUES" has the meaning given to it in Section 4.1.6.

"USD" means United States Dollars.

"VEGA" has the meaning given to it in Section 4.2.4.

"VIX INDEX" means the CBOE Volatility Index, identified by its RIC .VIX.

7. VERSIONING

VERSION	DATE	DESCRIPTION
1.0	December 18th, 2024	Initial Guideline creation (*initial version*)
1.1	September, 30th 2025	Add Indicative Index.

Table 3 Versioning

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