

INDEX METHODOLOGY

HSBC Risk Balanced Inflation Index

Version 1.0

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INTRODUCTION

This document (the “**Index Methodology**”) describes the methodology with regard to the composition, calculation and maintenance of the **HSBC Risk Balanced Inflation Index Family** (the “**Index Family**”). Any amendment to the Index rules is subject to the approval of an oversight committee, as specified in section 4.5. 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**”). The name “Solactive” is trademarked. The Index Family is owned by HSBC Bank plc (“**HSBC**”). This document and the policies and guidelines referenced herein contain the underlying principles and rules regarding the construction and operation of the Index. The Index is proprietary to HSBC. No use or publication may be made of the Index, or any of its provisions or values, without the prior written consent of HSBC.

Neither HSBC nor Solactive assumes any obligation or duty to any party and under no circumstances does HSBC or Solactive assume any relationship of agency or trust or of a fiduciary nature for or with any party. Any calculations or determinations in respect of the Index or any part thereof shall, unless otherwise specified, be made by Solactive, acting in good faith and in a commercially reasonable manner and shall (except in the case of manifest error) be final, conclusive and binding. The term "manifest error" as used herein shall mean an error that is plain and obvious and can be identified from the results of the calculation or determination itself without: (i) recourse to any underlying data; or (ii) any application or re-application of any formulae.

Neither HSBC nor Solactive makes any express or implied representations or warranties as to (a) the advisability of purchasing or assuming any risk in connection with any transaction or investment linked to the Index, (b) the levels at which the Index stands at any particular time on any particular date, (c) the results to be obtained by any party from the use of the Index or any data included in it for the purposes of issuing securities or carrying out any financial transaction linked to the Index, or (d) any other matter. Calculations may be based on information obtained from various publicly available sources. Solactive has relied on these sources and has not independently verified the information extracted from these sources and accepts no responsibility or liability in respect thereof.

Without prejudice to the foregoing, in no event shall HSBC or Solactive have any liability for any indirect, special, punitive or consequential damages (provided that any such damage is not reasonably foreseeable) even if notified of the possibility of such damages. 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 Index Family is denominated in USD (the “**Index Currency**”) and follows a rules-based, quantitative, long-only asset allocation strategy.

Each Index dynamically allocates across a diversified portfolio of 8 assets (each, an “**Asset**”) consisting of 7 exchange-traded funds (each, an “**ETF Asset**”) and the “**Cash Asset**”. The weight of each Asset is subject to caps.

Each Index applies a risk parity methodology to allocate between the Assets. Each Index seeks to allocate to the portfolio of Assets on a risk-weighted basis. Such allocation is adjusted on a quarterly basis.

In addition, each Index incorporates a transaction cost of 0.02% deducted every time the composition of the portfolio of Assets or the exposure of the Index to the portfolio of Assets is adjusted.

1.2. IDENTIFIERS AND PUBLICATION

The indices belong to the Index Family, and are published under the following identifiers:

Name	ISIN	Currency	Type	RIC	Bloomberg code
HSBC Risk Balanced Inflation Index (USD) Excess Return	DE000SLOFV44	USD	ER	.HSIEBIER	HSIEBIER Index
HSBC Risk Balanced Inflation Index (USD) Base Total Return	DE000SLOFV36	USD	GTR	.HSIEBIBT	HSIEBIBT Index
HSBC Risk Balanced Inflation Index (USD) Adjusted Net Total Return	DE000SLOFV36	USD	NTR	.HSIEBIBN	HSIEBIBN Index

Each Index is published via the price marketing services of Boerse Stuttgart GmbH and may be distributed to all of its affiliated vendors. Each vendor decides on an individual basis as to whether it will distribute or display the Index via its information systems. In the event that the level of the Index cannot be provided to the price marketing services of Boerse Stuttgart GmbH, the Index cannot be published.

1.3. CALCULATION FREQUENCY

HSBC Risk Balanced Inflation Index (USD) Excess Return

The level of the Index is calculated in respect of each Index Business Day from, and including, **20th July 2005** (the “**Index Start Date 1**”). The level of the Index has been calculated on a live basis from, and including, **April 29th 2022** (the “**Index Live Date 1**”). The initial level of the Index on the **Index Start Date 1**, is 1000. Historical values from the Index Live Date 1, will be recorded in accordance with Article 8 of the BMR. Levels of the Index published for a period prior to the **Index Start Date 1** have been back-tested.

HSBC Risk Balanced Inflation Index (USD) Base Total Return

The level of the Index is calculated in respect of each Index Business Day from, and including, **24th February 2005** (the “**Index Start Date 2**”). The level of the Index has been calculated on a live basis from, and including, **April 29th 2022** (the “**Index Live Date 2**”). The initial level of the Index on the Index Start Date 2, is 100. Historical values from the Index Live Date 2, will be recorded in accordance with Article 8 of the BMR. Levels of the Index published for a period prior to the Index Live Date 2 have been back-tested.



HSBC Risk Balanced Inflation Index (USD) Adjusted Net Total Return

The level of the Index is calculated in respect of each Index Business Day from, and including, **24th February 2005** (the “**Index Start Date 3**”). The level of the Index has been calculated on a live basis from, and including, **TBD** (the “**Index Live Date 3**”). The initial level of the Index on the Index Start Date 3, is 100. Historical values from the Index Live Date 3, will be recorded in accordance with Article 8 of the BMR. Levels of the Index published for a period prior to the Index Live Date 3 have been back-tested.

2. CALCULATION OF THE INDEX

2.1. INDEX CONSTITUENTS

Each Index dynamically allocates across a diversified portfolio of 8 Assets set forth in the Table of Assets below.

The weight of each Asset is subject to a cap (the “**Asset Cap**”) as set forth in the Table of Assets below.

Table of Assets

Asset	Bloomberg Code	Primary Exchange	Asset Cap	Currency
SPDR® CONSUMER STAPLES SPDR ETF	XLP	NYSE Arca	60%	USD
SPDR® UTILITIES SELECT SECTOR SPDR ETF	XLU	NYSE Arca	60%	USD
SPDR® ENERGY SELECT SECTOR SPDR ETF	XLE	NYSE Arca	60%	USD
SPDR® MATERIALS SELECT SECTOR SPDR ETF	XLB	NYSE Arca	60%	USD
SPDR® GOLD SHARES ETF	GLD	NYSE Arca	60%	USD
ISHARES® US REAL ESTATE SECTOR ETF	IYR	NYSE Arca	60%	USD
ISHARES® TIPS BOND ETF	TIP	NYSE Arca	60%	USD
Cash Asset	Not Applicable	Not Applicable	0%	USD

* Subject as provided in section 3.2

2.2. INDEX LEVEL CALCULATION

HSBC Risk Balanced Inflation Index (USD) Excess Return

The level of the Index (the “**Index Level 1**”) in respect of the **Index Start Date 1** shall be equal to **1000**.

The **Index Level 1** in respect of each Index Business Day after the **Index Start Date 1** (“**Index Business Day t**”) shall be calculated in accordance with the following formula:



$$IL1_t = IL1_{t-1} \times \left[1 + E_{t-1} \left(\frac{ERPL_t}{ERPL_{t-1}} - 1 \right) - Fee \times \frac{Days_{t-1,t}}{360} - TC_t \right]$$

Where:

$IL1_t$	Means the Index Level 1 in respect of Index Business Day t;
$IL1_{t-1}$	Means the Index Level 1 in respect of the Index Business Day immediately preceding Index Business Day t;
$ERPL_t$	Means the ER Portfolio Level (as defined in section 2.4) in respect of Index Business Day t;
$ERPL_{t-1}$	Means the ER Portfolio Level in respect of the Index Business Day immediately preceding Index Business Day t;
Fee	Means 0.40% (per annum);
$Days_{t-1,t}$	Means the number of calendar days from, but excluding, the Index Business Day immediately preceding Index Business Day t to, and including, Index Business Day t-1; and
TC_t	Means the transaction cost in respect of Index Business Day t, calculated in accordance with the following formula

$$TC_t = \text{abs}(E_t - E_{t-1}) \times 0.02\%$$

Where:

E_t	Means the Exposure in respect of Index Business Day t;
E_{t-1}	Means the Exposure in respect of the Index Business Day immediately preceding Index Business Day t; and
abs	Means, followed by an amount in brackets, the absolute value of such amount.

The exposure (the “**Exposure**”) in respect of the **Index Start Date 1** shall be equal to **63.2891148946297%**.

The Exposure in respect of each Index Business Day shall be calculated in accordance with the following formula:

$$E_t = \min \left(\min(\text{Max Exposure}, E_{t-1} + \Delta), \max \left(E_{t-1} - \Delta, \frac{\text{Target Volatility}}{RV_{t-1}} \right) \right)$$

Where:

Max Exposure means **125%**;

Target Volatility means **3.50%**;



Δ means **25%**; and

RV_{t-1} means the Realized Volatility (as defined in section 2.3) in respect of Index Business Day t-1.

HSBC Risk Balanced Inflation Index (USD) Base Total Return

The level of the Index (the “**Index Level 2**”) in respect of the Index Start Date 2 shall be equal to **100**.

The Index Level 2 in respect of each Index Business Day after the Index Start Date 2 (“**Index Business Day t**”) shall be calculated in accordance with the following formula

$$IL2_t = IL2_{t-1} + \left(\sum_{i=1}^n U_{i,t-1} \times (TR_{i,t} - TR_{i,t-1}) \right) - 0.02\% \times \left(\sum_{i=1}^n \text{abs}(U_{i,t-1} - U_{i,t-2}) \times TR_{i,t-1} \right)$$

Where:

$IL2_t$ Means the Index Level 2 in respect of Index Business Day t;

$IL2_{t-1}$ Means the Index Level 2 in respect of the Index Business Day immediately preceding Index Business Day t (“**Index Business Day t-1**”);

$U_{i,t-1}$ Means the number of units of Asset i in respect of Index Business Day t-1, calculated in accordance with the following formula:

$$U_{i,t-1} = \frac{W_{i,t-1} \times IL2_{t-1}}{TR_{i,t-1}}$$

$W_{i,t-1}$ Means the Asset Weight (as defined in section 3.3) of Asset i (as defined in section 3.3) in respect of the Rebalancing Date immediately preceding Index Business Day t-1 (“**Rebalancing Date t-1**”);

$TR_{i,t}$ Means the Total Return Level (as defined in section 2.6) of Asset i in respect of Index Business Day t;

$TR_{i,t-1}$ Means the Total Return Level of Asset i in respect of Index Business Day t-1;

$U_{i,t-2}$ Means the number of units of Asset i in respect of the Index Business Day immediately preceding Index Business Day t-1 (“**Index Business Day t-2**”), calculated in accordance with the following formula:

$$U_{i,t-2} = \frac{W_{i,t-2} \times IL2_{t-2}}{TR_{i,t-2}}$$



$W_{i,t-2}$	Means the Asset Weight (as defined in section 3.3) of Asset i in respect of the Rebalancing Date immediately preceding Index Business Day t-1 (“ Rebalancing Date t-2 ”);
$IL2_{t-2}$	Means the Index Level 2 in respect of Index Business Day t-2;
$TR_{i,t-2}$	Means the Total Return Level of Asset i in respect of Index Business Day t-2;
n	Means the number of Assets.

HSBC Risk Balanced Inflation Index (USD) Adjusted Net Total Return

The level of the Index (the “**Index Level 3**”) in respect of the Index Start Date 3 shall be equal to **100**.

The Index Level 3 in respect of each Index Business Day after the Index Start Date 3 (“**Index Business Day t**”) shall be calculated in accordance with the following formula

$$IL3_t = IL3_{t-1} + \left(\sum_{i=1}^n U_{i,t-1} \times (NTR_{i,t} - NTR_{i,t-1}) \right) - 0.02\% \times \left(\sum_{i=1}^n \text{abs}(U_{i,t-1} - U_{i,t-2}) \times NTR_{i,t-1} \right) - \text{Fee} \times \frac{\text{Days}_{t-1,t}}{360} \times \sum_{i=1}^n U_{i,t-1} \times NTR_{i,t}$$

Where:

$IL3_t$	Means the Index Level 3 in respect of Index Business Day t;
$IL3_{t-1}$	Means the Index Level 3 in respect of the Index Business Day immediately preceding Index Business Day t (“ Index Business Day t-1 ”);
$U_{i,t-1}$	Means the number of units of Asset i in respect of Index Business Day t-1, calculated in accordance with the following formula:

$$U_{i,t-1} = \frac{W_{i,t-1} \times IL3_{t-1}}{NTR_{i,t-1}}$$

$W_{i,t-1}$	Means the Asset Weight (as defined in section 3.3) of Asset i (as defined in section 3.3) in respect of the Rebalancing Date immediately preceding Index Business Day t-1 (“ Rebalancing Date t-1 ”);
$NTR_{i,t}$	Means the Net Total Return Level (as defined in section 2.7) of Asset i in respect of Index Business Day t;
$TR_{i,t-1}$	Means the Total Return Level of Asset i in respect of Index Business Day t-1;
$U_{i,t-2}$	Means the number of units of Asset i in respect of the Index Business Day immediately preceding Index Business Day t-1 (“ Index Business Day t-2 ”), calculated in accordance with the following formula:



$$U_{i,t-2} = \frac{W_{i,t-2} \times IL3_{t-2}}{NTR_{i,t-2}}$$

$W_{i,t-2}$	Means the Asset Weight (as defined in section 3.3) of Asset i in respect of the Rebalancing Date immediately preceding Index Business Day t-1 (" Rebalancing Date t-2 ");
$IL3_{t-2}$	Means the Index Level 3 in respect of Index Business Day t-2;
$NTR_{i,t-2}$	Means the Net Total Return Level of Asset i in respect of Index Business Day t-2;
Fee	Means 0.85% (per annum);
$Days_{t-1,t}$	Means the number of calendar days from, but excluding, the Index Business Day immediately preceding Index Business Day t to, and including, Index Business Day t-1; and
n	Means the number of Assets.

2.3. REALIZED VOLATILITY CALCULATION

The realized volatility (the "**Realized Volatility**") in respect of **19th July 2005** shall be equal to **5.5301768808541%**.

The Realized Volatility in respect of each Index Business Day after **19th July 2005** ("**Index Business Day t**") shall be calculated in accordance with the following formula:

$$RV_t = \max (RV_{s,t}, RV_{l,t})$$

Where:

RV_t Means the Realized Volatility in respect of Index Business Day t;

$RV_{s,t}$ Means the short term realized volatility in respect of Index Business Day t, calculated in accordance with the following formula:

$$RV_{s,t} = \sqrt{252 \times Var_{s,t}}$$

Where:

$Var_{s,t}$ Means the short term realized variance in respect of Index Business Day t, determined in accordance with the following formula:

$$Var_{s,t} = \lambda_s \times Var_{s,t-1} + (1 - \lambda_s) \times \left[\ln \left(\frac{ERPL_t}{ERPL_{t-1}} \right) \right]^2$$



$Var_{s,t-1}$ Means the short term realized variance in respect of the Index Business Day immediately preceding Index Business Day t, provided that the short term realized variance in respect of **19th July 2005** shall be equal to **0.00102087987628029%**; and

λ_s Means 0.94;

$RV_{l,t}$ Means the long term realized volatility in respect of Index Business Day t, calculated in accordance with the following formula:

$$RV_{l,t} = \sqrt{252 \times Var_{l,t}}$$

Where:

$Var_{l,t}$ Means the long term realized variance in respect of Index Business Day t, determined in accordance with the following formula:

$$Var_{l,t} = \lambda_l \times Var_{l,t-1} + (1 - \lambda_l) \times \left[\ln \left(\frac{ERPL_t}{ERPL_{t-1}} \right) \right]^2$$

$Var_{l,t-1}$ Means the long term realized variance in respect of the Index Business Day immediately preceding Index Business Day t, provided that the long term realized variance in respect of **19th July 2005** shall be equal to **0.00121360541006084%**; and

λ_l Means 0.97;

$ERPL_t$ Means the ER Portfolio Level (as defined in section 2.4) in respect of Index Business Day t; and

$ERPL_{t-1}$ Means the ER Portfolio Level in respect of the Index Business Day immediately preceding Index Business Day t.

2.4. ER PORTFOLIO LEVEL CALCULATION

The excess return level of the portfolio (the “**ER Portfolio Level**”) in respect of **24th February 2005** (the “**ER Portfolio Start Date**”) shall be equal to 100.

The ER Portfolio Level in respect of each Index Business Day after the ER Portfolio Start Date (“**Index Business Day t**”) shall be calculated in accordance with the following formula:

$$ERPL_t = ERPL_{t-1} \times \left[1 + \left(\frac{RP_t}{RP_{t-1}} - 1 \right) - \left(\frac{C_t}{C_{t-1}} - 1 \right) \right]$$

$ERPL_t$ Means the ER Portfolio Level in respect of Index Business Day t;



$ERPL_{t-1}$	Means the ER Portfolio Level in respect of the Index Business Day immediately preceding Index Business Day t;
RP_t	Means the Reference Portfolio Level (as defined in section 2.5) in respect of Index Business Day t;
RP_{t-1}	Means the Reference Portfolio Level in respect of the Index Business Day immediately preceding Index Business Day t;
C_t	Means the Total Return Level (as defined in section 2.6) of the Cash Asset in respect of Index Business Day t; and
C_{t-1}	Means the Total Return Level of the Cash Asset in respect of the Index Business Day immediately preceding Index Business Day t.

2.5. REFERENCE PORTFOLIO LEVEL CALCULATION

The reference level of the portfolio (the “**Reference Portfolio Level**”) in respect of the ER Portfolio Start Date shall be equal to 100.

The Reference Portfolio Level in respect of each Index Business Day after the ER Portfolio Start Date (“**Index Business Day t**”) shall be calculated in accordance with the following formulas:

$$RP_t = RP_{t-1} + \left(\sum_{i=1}^n U_{i,t-1} \times (TR_{i,t} - TR_{i,t-1}) \right) - 0.02\% \times \left(\sum_{i=1}^n \text{abs}(U_{i,t-1} - U_{i,t-2}) \times TR_{i,t-1} \right)$$

Where:

RP_t	Means the Reference Portfolio Level in respect of Index Business Day t;
RP_{t-1}	Means the Portfolio Level in respect of the Index Business Day immediately preceding Index Business Day t (“ Index Business Day t-1 ”);
$U_{i,t-1}$	Means the number of units of Asset i in respect of Index Business Day t-1, calculated in accordance with the following formula:

$$U_{i,t-1} = \frac{W_{i,t-1} \times RP_{t-1}}{TR_{i,t-1}}$$

$W_{i,t-1}$	Means the Asset Weight (as defined in section 3.3) of Asset i (as defined in section 3.3) in respect of the Rebalancing Date immediately preceding Index Business Day t-1 (“ Rebalancing Date t-1 ”);
$TR_{i,t}$	Means the Total Return Level (as defined in section 2.6) of Asset i in respect of Index Business Day t;



$TR_{i,t-1}$	Means the Total Return Level of Asset i in respect of Index Business Day t-1;
$U_{i,t-2}$	Means the number of units of Asset i in respect of the Index Business Day immediately preceding Index Business Day t-1 (" Index Business Day t-2 "), calculated in accordance with the following formula:
$U_{i,t-2} = \frac{W_{i,t-2} \times RP_{t-2}}{TR_{i,t-2}}$	
$W_{i,t-2}$	Means the Asset Weight (as defined in section 3.3) of Asset i in respect of the Rebalancing Date immediately preceding Index Business Day t-1 (" Rebalancing Date t-2 ");
RP_{t-2}	Means the Portfolio Level in respect of Index Business Day t-2;
$TR_{i,t-2}$	Means the Total Return Level of Asset i in respect of Index Business Day t-2; and
n	Means the number of Assets.

2.6. TOTAL RETURN LEVEL OF AN ASSET

The total return level (the "**Total Return Level**") of each Asset in respect of **19 November 2004** ("**Asset Total Return Level Start Date**") shall be equal to 100.

The Total Return Level of each Asset ("**Asset i**") in respect of each Index Business Day after the Asset Total Return Level Start Date ("**Index Business Day t**") shall be calculated in accordance with the following formula:

- a) If Asset i is the Cash Asset:

$$TR_{\text{Cash},t} = TR_{\text{Cash},t-1} \times \left(1 + r_{t-1} \times \frac{\text{Act}_{t-1,t}}{360} \right)$$

Where:

$TR_{\text{Cash},t}$	Means the Total Return Level of the Cash Asset in respect of Index Business Day t;
$TR_{\text{Cash},t-1}$	Means the Total Return Level of the Cash Asset in respect of the Index Business Day immediately preceding Index Business Day t;
r_{t-1}	Means (i) if Index Business Day t falls prior to 2 April 2018, the Federal Funds Rate in respect of the Index Business Day immediately preceding Index Business Day t (ii) otherwise the SOFR in respect of the Index Business Day immediately preceding Index Business Day t; and
$\text{Act}_{t-1,t}$	Means the number of calendar days from, but excluding, the Index Business Day immediately preceding Index Business Day t to, and including, Index Business Day t;



b) Otherwise:

$$TR_{i,t} = TR_{i,t-1} \times \frac{P_{i,t} + Div_{i,t}}{P_{i,t-1}}$$

Where:

$TR_{i,t}$	Means the Total Return Level of Asset i in respect of Index Business Day t;
$TR_{i,t-1}$	Means the Total Return Level of Asset i in respect of the Index Business Day immediately preceding Index Business Day t (as determined in accordance with section 4 ¹ , if applicable);
$P_{i,t}$	Means the Price of Asset i in respect of Index Business Day t;
$P_{i,t-1}$	Means the Price of Asset i in respect of the Index Business Day immediately preceding Index Business Day t; and
$Div_{i,t}$	Means the aggregate amount of dividends for Asset i with an ex-dividend date falling in the period from, but excluding, the Index Business Day immediately preceding Index Business Day t to, and including, Index Business Day t.

2.7. NET TOTAL RETURN LEVEL OF AN ASSET

The net total return level (the “**Net Total Return Level**”) of each Asset in respect of **19 November 2004** (“**Asset Net Total Return Level Start Date**”) shall be equal to 100.

The Net Total Return Level of each Asset (“**Asset i**”) in respect of each Index Business Day after the Asset Net Total Return Level Start Date (“**Index Business Day t**”) shall be calculated in accordance with the following formula:

- c) If Asset i is the Cash Asset, the Net Total Return Level means the Total Return Level as described in section 2.5
- d) Otherwise:

$$NTR_{i,t} = NTR_{i,t-1} \times \frac{P_{i,t} + (1 - TaxRate) \times Div_{i,t}}{P_{i,t-1}}$$

Where:

$NTR_{i,t}$	Means the Net Total Return Level of Asset i in respect of Index Business Day t;
$NTR_{i,t-1}$	Means the Net Total Return Level of Asset i in respect of the Index Business Day immediately preceding Index Business Day t (as determined in accordance with section 4, if applicable);
$P_{i,t}$	Means the Price of Asset i in respect of Index Business Day t;



$P_{i,t-1}$	Means the Price of Asset i in respect of the Index Business Day immediately preceding Index Business Day t; and
$Div_{i,t}$	Means the aggregate amount of dividends for Asset i with an ex-dividend date falling in the period from, but excluding, the Index Business Day immediately preceding Index Business Day t to, and including, Index Business Day t.
TaxRate	Means 30.00%

2.8. PUBLICATION AND ACCURACY

The Index Level is published around 16:50 New York time on Bloomberg and Reuters with levels rounded to two decimal places.

2.9. CORPORATE ACTIONS

Corporate actions on the Assets that are exchange-traded funds (other than dividends) will be treated in accordance with the methodology described in the Solactive [Equity Index Methodology](#), which is incorporated by reference herein and available on the Solactive website: www.solactive.com (as updated from time to time).

2.10. RECALCULATION

Solactive makes the greatest possible efforts to accurately calculate and maintain its indices. However, errors in the index determination process may occur from time to time for a variety of reasons (internal or external) and therefore, cannot be completely ruled out. Solactive endeavors to correct all errors that have been identified within a reasonable timeframe. Such timeframe, as well as the general measures to be taken generally depend on the underlying and are specified in the Solactive [Correction Policy](#), which is incorporated by reference herein and available on the Solactive website: www.solactive.com (as updated from time to time).

2.11. MARKET DISRUPTION

Subject to section 2.11 hereof, following certain market disruption events, Solactive calculates its indices following predefined and exhaustive arrangements, as described in the Solactive [Disruption Policy](#), which is incorporated by reference herein and available on the Solactive website: www.solactive.com (as updated from time to time). Such market disruption events can arise due to a variety of reasons, and generally result in inaccurate or delayed prices for one or more components of the Index. The determination of the Index may be limited or impaired at times of illiquid or fragmented markets and market stress.

2.12. EXTRAORDINARY EVENTS

Extraordinary and unforeseeable events not addressed by this section 2.11 will be treated as described in section 4.9 of the Solactive [Disruption Policy](#).

- a) Extraordinary Events Definition. “**Extraordinary Event**” in respect of an ETF Asset means an event deemed as extraordinary by Solactive, which may include, by way of example and without limitation:



- i) an ETF Asset is de-listed from the relevant exchange for such ETF Asset, liquidated, or otherwise terminated; or
 - ii) the Price of any ETF Asset is not published by the Primary Exchange where it is listed for 8 consecutive Index Business Days.
- b) Consequences of Extraordinary Events. For any ETF Asset, (i) if its Price is not published by its Primary Exchange, but is published by a successor Primary Exchange acceptable to Solactive or (ii) if it is replaced by a successor ETF whose underlying commodities are the same as those of the replaced ETF Asset or whose ETF Underlying Index is either the same as that of the replaced ETF Asset or is an index using, in Solactive's determination, the same or a substantially similar formula for and method of calculation as used in the calculation of the replaced ETF Asset's ETF Underlying Index and, in any case, whose sponsor is acceptable to Solactive, then in the case of (i) or (ii) above that ETF Asset will thereafter be deemed to be the successor ETF so calculated and announced by that successor sponsor described in (i) above or that successor ETF described in (ii) above, as the case may be, with effect from a date determined by Solactive, who may make such adjustments to these Index rules as it determines are appropriate to account for such change. Upon the acceptance of a successor ETF by Solactive, such successor shall take the place of the relevant ETF Asset. For the avoidance of doubt, the prior daily prices of such successor shall be used in future calculations of the Reference Portfolio Level in future.
- c) The consequences of Extraordinary Events in section 2.11(b) will supersede anything to the contrary in the Solactive Equity Index Methodology or the Solactive Disruption Policy.

2.13. SOFR UNAVAILABILITY AND CESSATION

(a) In the event that SOFR does not appear on the applicable price source at approximately 3:00 p.m., eastern standard time, on any Calculation Day, then SOLACTIVE will use for the calculation of the Index the most recent available SOFR published by the Federal Reserve Bank of New York.

(b) If SOLACTIVE determines that SOFR (1) is no longer representative as announced in a public statement or publication of information by the regulatory supervisor for the administrator of SOFR; or (2) has been discontinued at any time, it will substitute for SOFR an industry-accepted substitute or successor rate (the "**SOFR Successor Rate**"), including any adjustment to or related spread on such SOFR Successor Rate, in each case in its sole discretion and in accordance with section 3.6. In the event that SOLACTIVE determines, in its sole discretion, that there is no industry-accepted substitute or successor rate and that there are no quotations provided as described in section 3.5(a), then, after consulting such sources as it deems reasonable, it will estimate SOFR in its sole discretion from time to time to use as the SOFR Successor Rate. Further, if SOLACTIVE subsequently determines, in its sole discretion, that an industry-accepted substitute or successor rate has emerged or otherwise become available, it will cease to estimate the SOFR Successor Rate and instead substitute such industry-accepted substitute or successor rate as provided in the first sentence of this section 3.5(b).

If SOLACTIVE has determined a SOFR Successor Rate (including any such adjustment and/or spread) in accordance with the foregoing, SOLACTIVE in its sole discretion may also implement changes to the Index rules as it determines are appropriate to account for such change to the SOFR Successor Rate in a manner that is consistent with industry-accepted practices for the SOFR Successor Rate. Once SOLACTIVE chooses a SOFR Successor Rate, such SOFR Successor Rate will be used in place of SOFR for all calculations, and the term "**SOFR**" as used in this methodology, shall be then deemed to refer to the SOFR Successor Rate.



3. REBALANCING OF THE INDEX

3.1. INDEX REBALANCING

In respect of each Selection Date, a risk-parity process as described below (the “**Portfolio Risk Parity Process**”) is performed by the Index Calculation Agent and the Index Administrator will revise the composition of each Index. The determination of the composition of each Index is fully rule-based; the Index Administrator has no discretion. The rebalancing of each Index is then performed on the Rebalancing Date.

3.2. PORTFOLIO RISK PARITY PROCESS

In respect of each Selection Date, a “**Risk Parity**” portfolio of Assets shall be determined.

3.3. DETERMINATION OF ASSET WEIGHTS

With \mathbf{W} being the vector for weights for each Asset i , and Σ being the covariance matrix of the reference portfolio as described in Section 3.4.

The weight (“**Asset Weight**”) of each Asset (“**Asset i** ”) in respect of each Selection Date (“**Selection Date s** ”) shall be calculated by minimizing the following formula:

$$w_{s,i} = \arg \min \sum_{i=1}^N \left[RC_{s,i} - \frac{\sqrt{\mathbf{W}_s^T \Sigma_s \mathbf{W}_s}}{N} \right]^2$$

Subject to the following constraints:

- 1) $\mathbf{1}^T \mathbf{W}_s = 1$
- 2) **Asset Cap** $\geq \mathbf{W}_s \geq 0\%$

Where:

$RC_{s,i}$ In respect to the **Selection Date s** , means the Risk Contribution (RC) for each Asset i defined as:

$$RC_{s,i} = w_{s,i} \frac{\Sigma_s \mathbf{W}_s}{\sqrt{\mathbf{W}_s^T \Sigma_s \mathbf{W}_s}}$$

\mathbf{W}_s Means the vector of Assets Weights in respect to the **Selection Date s** ;

$w_{s,i}$ Means the weight for Asset i in respect to the **Selection Date s** ;

Σ_s In respect to the **Selection Date s** , means the matrix of covariance (as described in Section 3.4) of the reference portfolio defined as:

$$\begin{bmatrix} \text{Cov}_{1,N} & \cdots & \text{Cov}_{1,N} \\ \vdots & \ddots & \vdots \\ \text{Cov}_{N,1} & \cdots & \text{Cov}_{N,N} \end{bmatrix}$$



N Means the number of Assets.

3.4. VARIANCE OF AN REFERENCE PORTFOLIO

The variance (“**Variance**”) of a Reference Portfolio in respect of a Selection Date (“**Selection Date s**”) shall be calculated in accordance with the following formula:

$$\text{Var}_s = \sum_{i,j=1}^n W_i' \times W_j' \times \text{Cov}_{i,j}$$

Where:

Var_s Means the Variance of such Reference Portfolio in respect of Selection Date s;

W_i' Means the weight attributed to Asset i in such Reference Portfolio;

W_j' Means the weight attributed to Asset j in such Reference Portfolio;

n Means the number of Assets; and

$\text{Cov}_{i,j}$ Means the covariance between Asset i and Asset j, calculated in accordance with the following formula:

$$\text{cov}_{i,j} = \frac{252}{(N-1)} \sum_{k=0}^{N-1} \left(\left(\frac{\text{TR}_{i,s-k}}{\text{TR}_{i,s-k-1}} - 1 \right) - \bar{R}_i \right) \times \left(\left(\frac{\text{TR}_{j,s-k}}{\text{TR}_{j,s-k-1}} - 1 \right) - \bar{R}_j \right)$$

Where:

N Means **60**;

$\text{TR}_{i,s-k}$ Means the Total Return Level of Asset i in respect of the Index Business Day falling k Index Business Days before Selection Date s;

$\text{TR}_{i,s-k-1}$ Means the Total Return Level of Asset i in respect of the Index Business Day falling k+1 Index Business Days before Selection Date s;

$\text{TR}_{j,s-k}$ Means the Total Return Level of Asset j in respect of the Index Business Day falling k Index Business Days before Selection Date s;

$\text{TR}_{j,s-k-1}$ Means the Total Return Level of Asset j in respect of the Index Business Day falling k+1 Index Business Days before Selection Date s;

\bar{R}_i Means an amount calculated in accordance with the following formula:

$$\bar{R}_i = \frac{1}{N} \times \sum_{k=0}^{N-1} \left(\frac{\text{TR}_{i,s-k}}{\text{TR}_{i,s-k-1}} - 1 \right); \text{ and}$$

\bar{R}_j Means an amount calculated in accordance with the following formula:



$$\bar{R}_j = \frac{1}{N} \times \sum_{k=0}^{N-1} \left(\frac{TR_{j,s-k}}{TR_{j,s-k-1}} - 1 \right).$$

4. MISCELLANEOUS

4.1. DISCRETION

Any discretion which may need to be exercised in relation to the determination of the Index shall be limited to (i) exercising routine judgment (in the expert view of the Index Administrator) in the administration of the Index rules, provided that such routine judgment does not include deviations or alterations to the Index rules that are designed to improve the financial performance of the Index, (ii) correcting errors in the implementation of the rules or calculations made pursuant to the rules, or (iii) making an adjustment to respond to an unanticipated event outside of Solactive's control, such as a stock split, merger, listing or delisting, nationalization, insolvency, a disruption in the financial markets for specific assets or in a particular jurisdiction, regulatory compliance requirement, force majeure, or any other unanticipated event of similar magnitude and significance, subject to sections 2.8 through 2.12 hereof.

4.2. METHODOLOGY REVIEW

The Index Methodology is reviewed annually to ensure that it remains representative of the relevant market or economic reality the Index is intended to reflect.

4.3. CHANGES IN CALCULATION METHOD

The application by the Index Calculation Agent of the method described in this document is final and binding. The Index Calculation Agent shall apply the method described above for the composition and calculation of the Index. However, it cannot be excluded that the market environment, supervisory, legal, financial or tax reasons may require changes to be made to this method. In such cases, the Index Administrator may make changes to the terms and conditions of the Index and the method applied to calculate the Index to the extent that it deems necessary and desirable in order to prevent obvious or demonstrable error or to remedy, correct or supplement incorrect terms and conditions.

4.4. TERMINATION

Solactive makes the greatest possible efforts to ensure the resilience and continued integrity of its indices over time. Nevertheless, if no other options are available, the orderly cessation of an index may be necessary. This is usually the case when (i) 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, (ii) the index rules, and particularly the selection criteria, can no longer be applied coherently, or (iii) the Index is no longer used as the underlying value for financial instruments, investment funds and financial contracts.

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



4.5. OVERSIGHT

The Index Administrator is responsible for decisions regarding any amendments to the Index rules. Any such amendment, which may result in an amendment of the Index Methodology, must be submitted to an oversight committee for prior approval, in accordance with Solactive's "Methodology Policy", which is available at www.solactive.com.

5. DEFINITIONS

"Asset" has the meaning given to it in section 1.1.

"Asset Cap" has the meaning given to it in section 2.1.

"Asset i" has the meaning given to it in section 2.6.

"Asset Total Return Level Start Date" has the meaning given to it in section 2.6.

"Asset Net Total Return Level Start Date" has the meaning given to it in section 2.7.

"Asset Weight" has the meaning given to it in section 3.3.

"Benchmark Regulation" or "BMR" has the meaning given to it in the Introduction.

"Reference Portfolio" means any hypothetical portfolio composed of the Assets that satisfies the following constraints: (i) the weights attributed to the Assets do not breach the Asset Caps (as detailed in the Table of Assets in section 2.1); (ii) the weight attributed to each Asset must not be negative; and (iii) the aggregate of the weights attributed to the Assets must be equal to 1.

"ER Portfolio Level" has the meaning given to it in section 2.4.

"ER Portfolio Start Date" has the meaning given to it in section 2.4.

"ETF Asset" has the meaning given to it in section 1.1.

"ETF Underlying Index" means, in respect of an ETF Asset, the index underlying such ETF Asset.

"Extraordinary Event" has the meaning given to it in section 2.11.

"Federal Funds Rate" means the target interest rate set by the Federal Open Market Committee (FOMC) at which commercial banks borrow and lend their excess reserves to each other overnight.

"HSBC" means HSBC Bank plc.

"Index Family" has the meaning given to it in the Introduction.

"Index Administrator" means Solactive AG.

"Index Business Day" means each day on which the Primary Exchanges in respect of all the Assets are scheduled to be open for trading for their regular trading session.

"Index Calculation Agent" means Solactive AG.

"Index Currency" has the meaning given to it in section 1.1.

"Index Level 1" has the meaning given to it in section 2.2.

"Index Level 2" has the meaning given to it in section 2.2.



“Index Level 3” has the meaning given to it in section 2.2.

“Index Live Date 1” has the meaning given to it in section 1.3.

“Index Live Date 2” has the meaning given to it in section 1.3.

“Index Live Date 3” has the meaning given to it in section 1.3.

“Index Methodology” has the meaning given to it in the Introduction.

“Index Start Date 1” has the meaning given to it in section 1.3.

“Index Start Date 2” has the meaning given to it in section 1.3.

“Index Start Date 3” has the meaning given to it in section 1.3.

“Portfolio Risk Parity Process” has the meaning given to it in section 3.1.

“Price” means, in respect of an Index Business Day and each ETF Asset, the official closing price of such Asset on such Index Business Day on the Primary Exchange in respect of such Asset as published by the Price Source.

“Price Source” means the Thomson Reuters Corporation (including any successor publisher).

“Primary Exchange” means, in respect of an Asset, the exchange on which such Asset is primarily listed. The Primary Exchange of each Asset as of the Index Live Date is set forth in the column “Primary Exchange” in the Table of Assets in section 2.1.

“Realized Volatility” has the meaning given to it in section 2.3.

“Rebalancing Date” means (i) the Reference Portfolio Start Date and (ii) the third Index Business Day following each Selection Date, after the Reference Portfolio Start Date.

“Reference Portfolio Level” has the meaning given to it in section 2.5.

“Selection Date” means the third Friday of every February, May, August, November after the Reference Portfolio Start Date, or, in each case, if such day is not an Index Business Day, the immediately preceding Index Business Day.

“Solactive” has the meaning given to it in the Introduction.

“SECURED OVERNIGHT FINANCING RATE” or “SOFR” means the daily secured overnight financing rate as provided by the SOFR Administrator on the SOFR Administrator’s Website.

“SOFR Successor Rate” has the meaning given to it in section 2.12.

“Total Return Level” has the meaning given to it in section 2.6.

“Net Total Return Level” has the meaning given to it in section 2.7.

“Variance” has the meaning given to it in section 3.4.

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