

# iSTOXX® STRATEGY INDICES METHODOLOGY GUIDE

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# 1. INTRODUCTION TO THE STOXX INDEX GUIDES

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The STOXX index guides are separated into the following sub-sets:

- » The **STOXX Calculation guide** provides a general overview of the calculation of the STOXX equity indices, the dissemination, the index formulas and adjustments due to corporate actions
- » The **STOXX Index Methodology guide** contains the equity index specific rules regarding the construction and derivation of the portfolio based indices, the individual component selection process and weighting schemes
- » The **STOXX World Equity Index Methodology guide** contains the index specific rules regarding the construction and derivation of the STOXX World portfolio based indices, the individual component selection process and weighting schemes
- » The **STOXX Strategy Index guide** contains the formulas and description of all strategy indices
- » The **STOXX DVP Calculation guide** describes the dividend points products
- » The **STOXX Distribution Points Calculation guide** describes the distribution points products
- » The **iSTOXX Strategy Indices Methodology guide** contains the index specific rules regarding the construction and derivation of the iSTOXX Strategy indices, the individual component selection process and weighting schemes
- » The **iSTOXX Fund Indices Methodology guide** contains the index specific rules regarding the construction and derivation of the iSTOXX Fund indices, the individual component selection process and weighting schemes
- » The **iSTOXX Decrement Indices Methodology guide** contains the index specific rules regarding the construction and derivation of the iSTOXX Decrement indices, the individual component selection process and weighting schemes
- » The **iSTOXX Equity Indices Methodology guide** contains the index specific rules regarding the construction and derivation of the iSTOXX Equity indices, the individual component selection process and weighting schemes
- » The **STOXX Reference Rates guide** contains the rules and methodologies of the reference rate indices
- » The **STOXX Reference Calculations guide** provides a detailed view of definitions and formulas of the calculations as utilized in the reports, factsheets, indices and presentations produced by STOXX
- » The **STOXX Currency Rates Indices Methodology guide** contains the index specific rules regarding the construction and calculation of the derivation of the STOXX FX Rolling Spot Mid Rate and STOXX FX Rolling Spot Tomorrow Next Open Rate indices
- » The **Guide to Industry Classifications Used By STOXX** contains general information pertaining to industry classifications used in STOXX indices, together with any references and links to third-parties that create the data.
- » The **STOXX Eligible Market Segments guide** contains the list of stock exchanges and market segments.

All rule books are available for download on <http://www.stoxx.com/indices/rulebooks.html>

## 2. GENERAL PRINCIPLE

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### 2.1. INDEX RATIONALE

STOXX defines the index rationale as the basis for applying a certain methodology in order to achieve the index objective. STOXX performs intensive research and may conduct conversations with market participants and third parties for this purpose. STOXX discloses the index objective in every case.

### 2.2. METHODOLOGY REVIEW POLICIES

STOXX constantly monitors the execution of the index calculation rules in order to ensure the validity of the index methodology. STOXX also conducts general methodology reviews in a periodic and ad-hoc basis, to reflect economic and political changes and developments in the investment industry. As result of these activities, STOXX introduces changes to the methodology books. Material changes are notified to subscribers and the media through the usual communication channels. Clarifications of the methodology are updated in the rulebook. All changes are tracked in the section History of changes to the STOXX Strategy Guide.

### 2.3. INDEX TERMINATION POLICY

For the termination of an index or index family for which outstanding products are present in the market to the knowledge of STOXX, a market consultation with the involved clients will be initiated by STOXX to take into account their views and concerns related to the termination or transition. A consultation period will be opened. Its duration depends on the specific issue. After the consultation period and in case of further action needed, a notification will be issued and the process defined above will be followed. In the case of a transition, STOXX will launch the alternative index and will notify of its character as a suitable replacement for an existing index whose calculation should be discontinued in the future. This notification advises clients on the alternative recommended by STOXX as replacement. The timeframe in which both indices will be calculated in parallel will be disclosed in the notification's text and will be no shorter than three months.

For the termination of an index or index family for which, to the knowledge of STOXX, no listed financial products are issued in the market, a press release notification or e-mail notification to subscribers will be communicated at least three months before coming into force. Clients or third parties with interest in the index or index family are urged to communicate as soon as possible their concerns to STOXX. Based on the feedback collected, STOXX may alter the index termination decision. For the termination of an index without financial product issued on there will be no market consultation. Changes to the original notification will be communicated in the same manner.

## 2. GENERAL PRINCIPLE

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### 2.4. REPLACEMENT FOR INDICES WITH FIXED NUMBER OF CONSTITUENTS

When referred to this section the below applies only during review implementation month:

During review implementation month, the published review report in combination with the selection list will be used to select a replacement. With the public announcement of the review report in the review implementation month, the highest ranked non-component from the selection list, which is not announced an addition to the affected index from the review report at the review effective date, will replace the deleted stock ("next viable replacement").

For certain replacements occurring during review month and before the rebalancing date:

- If a deleted stock was scheduled for a deletion in an (size) index at the review effective date to a lower size index or entirely, the afore-mentioned process of adding the next viable replacement applies. However, to balance the number of additions and deletions at the review effective date, the lowest ranked index component on the selection list, within the same (size) index and which was not announced a deletion from the review report, will be deleted at the review effective date.

- If a deleted stock was scheduled for an addition in an (size) index at the review effective date, the afore-mentioned process of adding the next viable replacement applies. However, to balance the number of additions and deletions at the review effective date, the highest ranked index component on the selection list, within the same (size) index and which was not announced an addition from the review report, will replace the deleted addition at the review effective date.



## 3. DYNAMIC VSTOXX INDEX

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### 3.1. DYNAMIC VSTOXX INDEX

#### 3.1.1. OVERVIEW

The Dynamic VSTOXX Index is an “index of indices”, i.e. its value is calculated based on the value of other underlying indices.

The indices constituting the Dynamic VSTOXX index are the EURO STOXX 50 Volatility Short-Term Futures Index and EURO STOXX 50 Volatility Mid-Term Futures Index.

The goal of the dynamic allocation between the two components is to exploit the better returns short-term futures normally offer in non-stressed markets over longer termed futures. Non-stressed markets are typically associated with backwardation: an indicator of the current backwardation/contango status can be used to trigger the allocation between the two index components.

The portion allocated to each component index is adjusted on every Index Rebalancing Day and such an event can occur as frequently as daily, depending on certain conditions being met (please refer to the tables below for a detailed definition).

In essence, the allocation is triggered by the level reached by a Trading Signal, calculated as ratio of the closing values of the VSTOXX Index and VSTOXX 120 days Index: to a higher ratio level, corresponds a higher allocation to the EURO STOXX 50 Volatility Short-Term Futures Index. The tables detail how a Trading Signal is commuted into allocation weights for the three different index variants available: Standard, Long-Only and Alpha.

**Universe:** EURO STOXX 50 Volatility Short-Term Futures Index (VST1ME) and EURO STOXX 50 Volatility Mid-Term Futures Index (VMT5ME)

**Weighting scheme:** Signal-based, daily rebalanced.

**Base values and date:** 100 on June 17, 2010

**Index types and currencies:** Total return and excess return, in EUR, in real time

**Dissemination calendar:** STOXX Eurex Calendar

#### Index value formula

1. A Trading Signal is calculated as follow:

$$TS_d = \frac{\text{Index } A_d}{\text{Index } B_d}$$

Index  $A_d$  = Closing level of VSTOXX index (V2TX) on Index Calculation Day  $d$  and Index  
Index  $B_d$  = Closing level of VSTOXX120 days index (VSTX120) on Index Calculation Day  $d$ .

2. On any Index Calculation Day  $d$  the Target Exposure for Short-Term ( $STE_d$ ) and Mid-Term ( $MTE_d$ ) are calculated based on the Trading Signal calculated on the previous Index Calculation Day ( $TS_{d-1}$ ), according to the tables below.

### 3. DYNAMIC VSTOXX INDEX

3. On any Index Calculation Day  $d$  the Exposure for Short-Term ( $SE_d$ ) and Mid-Term ( $ME_d$ ) are calculated based on the Target Exposure for Short-Term and Mid-Term for that day ( $STE_d$ ,  $MTE_d$ ) and the Exposure for Short-Term and Mid-Term on the previous day ( $SE_{d-1}$ ,  $ME_{d-1}$ ):

$$SE_d = \begin{cases} \min(STE_d, SE_{d-1} + \text{buffer}) & \text{if } SE_{d-1} < STE_d \\ \max(STE_d, SE_{d-1} - \text{buffer}) & \text{if } SE_{d-1} > STE_d \\ SE_{d-1} & \text{otherwise} \end{cases}$$

$$ME_d = \begin{cases} \min(MTE_d, ME_{d-1} + \text{buffer}) & \text{if } ME_{d-1} < MTE_d \\ \max(MTE_d, ME_{d-1} - \text{buffer}) & \text{if } ME_{d-1} > MTE_d \\ ME_{d-1} & \text{otherwise} \end{cases}$$

Parameter buffer = 5%.

On Index Commencement Date ( $d = 0$ ):  $SE_0 = STE_0$  and  $ME_0 = MTE_0$

4. On any Index Calculation Day  $d$ , the value of the Excess Return Index at time  $t$  is calculated as:

$$I_t^{ER} = I_R^{ER} \cdot \left[ 1 + SE_R \cdot \left( \frac{SIU_t}{SIU_R} - 1 \right) + ME_R \cdot \left( \frac{MIU_t}{MIU_R} - 1 \right) \right]$$

$R$  (subscript) = Value of the relevant variable on the immediately preceding Rebalancing Date  $R$ , as described in formula 5  
 $SIU_t$  = Index Value at time  $t$  of the EURO STOXX 50 Volatility Short-Term Futures Index (VST1ME)  
 $MIU_t$  = Index Value at time  $t$  of the EURO STOXX 50 Volatility Mid-Term Futures Index (VMT5ME).

On Index Commencement Date ( $d = 0$ ),  $I_0^{ER} = 100.00$ .

5. An Index Rebalancing Day  $R$  is defined as:
- » First Index Calculation Day  $d$  of each calendar month, or
  - » Any Index Calculation Day  $d$  on which  $SE_d \neq SE_{d-1}$ , or
  - »  $\frac{I_{d-1}^{ER}}{I_R^{ER}} < 0.5$  Any Index Calculation Day  $d$  on which  $ME_d \neq ME_{d-1}$ , or
  - » Any Index Calculation Day  $d$  on which .

6. On any Index Calculation Day  $d$ , the value of the Total Return Index at time  $t$  is calculated as:

$$I_t^{TR} = I_{d-1}^{TR} \cdot \left[ \frac{I_t^{ER}}{I_{d-1}^{ER}} + CR_{d-1} \cdot \frac{\text{days}_{d-1, d}}{360} \right]$$

$CR_d$  = Official Close Value of €STR rate on Index Calculation Day  $d$   
 $\text{days}_{d-1}$  = Number of actual calendar days between the immediately preceding Index Calculation Day  $d-1$  (excluded) and the current Index Calculation Day  $d$  (included)

On Index Commencement Date ( $d = 0$ ),  $I_0^{TR} = 100.00$ .

### 3. DYNAMIC VSTOXX INDEX

#### List of Indices/Variants

The Index is calculated in 3 versions and 2 variants for each version:

1. Standard version:
  - a. Dynamic VSTOXX ER, as calculated in step 4
  - b. Dynamic VSTOXX TR, as calculated in step 6
2. Long-Only version:
  - a. Dynamic VSTOXX Long-Only ER, as calculated in step 4
  - b. Dynamic VSTOXX Long-Only TR, as calculated in step 6
3. Alpha version:
  - a. Dynamic VSTOXX Alpha ER, as calculated in step 4
  - b. Dynamic VSTOXX Alpha TR, as calculated in step 6

For the purpose of calculating Target Exposure for Short-Term ( $STE_d$ ) and Mid-Term ( $MTE_d$ ), the following assignments hold:

#### Standard Version

| Trading Signal ( $TS_{d-1}$ ) | Short-Term<br>( $STE_d$ ) | Target | Exposure | Mid-Term<br>( $MTE_d$ ) | Target | Exposure |
|-------------------------------|---------------------------|--------|----------|-------------------------|--------|----------|
| $TS_{d-1} < 100\%$            | -30%                      |        |          | 70%                     |        |          |
| $100\% \leq TS_{d-1} < 103\%$ | 0%                        |        |          | 100%                    |        |          |
| $103\% \leq TS_{d-1} < 110\%$ | 25%                       |        |          | 75%                     |        |          |
| $TS_{d-1} \geq 110\%$         | 50%                       |        |          | 50%                     |        |          |

#### Long-Only Version

| Trading Signal ( $TS_{d-1}$ ) | Short-Term<br>( $STE_d$ ) | Target | Exposure | Mid-Term<br>( $MTE_d$ ) | Target | Exposure |
|-------------------------------|---------------------------|--------|----------|-------------------------|--------|----------|
| $TS_{d-1} < 100\%$            | 0%                        |        |          | 0%                      |        |          |
| $100\% \leq TS_{d-1} < 103\%$ | 0%                        |        |          | 50%                     |        |          |
| $103\% \leq TS_{d-1} < 110\%$ | 25%                       |        |          | 75%                     |        |          |
| $TS_{d-1} \geq 110\%$         | 50%                       |        |          | 50%                     |        |          |

#### Alpha Version

| Trading Signal ( $TS_{d-1}$ ) | Short-Term<br>( $STE_d$ ) | Target | Exposure | Mid-Term<br>( $MTE_d$ ) | Target | Exposure |
|-------------------------------|---------------------------|--------|----------|-------------------------|--------|----------|
| $TS_{d-1} < 100\%$            | -50%                      |        |          | 50%                     |        |          |
| $100\% \leq TS_{d-1} < 103\%$ | -25%                      |        |          | 75%                     |        |          |
| $103\% \leq TS_{d-1} < 110\%$ | 25%                       |        |          | 75%                     |        |          |
| $TS_{d-1} \geq 110\%$         | 50%                       |        |          | 50%                     |        |          |

## 4. DYNAMIC VSTOXX NET OF COSTS INDEX

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### 4.1. DYNAMIC VSTOXX NET OF COSTS INDEX

#### 4.1.1. OVERVIEW

The Dynamic VSTOXX Net of Costs Index is conceptually similar to the Dynamic VSTOXX Index, but it additionally accounts for costs which are typically associated with the index replication process, with the goal of improving representativeness and replicability, for the benefit of the investor: Execution Costs associated with the Turnover and Replication Costs are included.

All costs are clearly stated and identifiable in the formulae, therefore ensuring the highest transparency to the investor.

The Dynamic VSTOXX Net of Costs is a combination of the EURO STOXX 50 Volatility Short-Term Futures Index and EURO STOXX 50 Volatility Mid-Term Futures Index.

The indices constituting the Dynamic VSTOXX index are the EURO STOXX 50 Volatility Short-Term Futures Index and EURO STOXX 50 Volatility Mid-Term Futures Index.

The goal of the dynamic allocation between the two components is to exploit the better returns short-term futures normally offer in non-stressed markets over longer termed futures. Non-stressed markets are typically associated with backwardation: an indicator of the current backwardation/contango status can be used to trigger the allocation between the two index components.

The portion allocated to each component index is adjusted on every Index Rebalancing Day and such an event can occur as frequently as daily, depending on certain conditions being met (please refer to the tables below for a detailed definition).

In essence, the allocation is triggered by the level reached by a Trading Signal, calculated as ratio of the closing values of the VSTOXX Index and VSTOXX 120 days Index: to a higher ratio level, corresponds a higher allocation to the EURO STOXX 50 Volatility Short-Term Futures Index. The tables detail how a Trading Signal is commuted into allocation weights for the three different index variants available: Standard, Long-Only and Alpha.

**Universe:** EURO STOXX 50 Volatility Short-Term Futures Index (VST1ME) and EURO STOXX 50 Volatility Mid-Term Futures Index (VMT5ME).

**Weighting scheme:** Signal-based, daily rebalanced.

**Base values and date:** 100 on June 17, 2010

**Index types and currencies:** Total return and excess return, in EUR, in real time

**Dissemination calendar:** STOXX Eurex Calendar

#### Index value formula

1. A Trading Signal is calculated as follow:

$$TS_t = \frac{IndexA_t}{IndexB_t}$$

## 4. DYNAMIC VSTOXX NET OF COSTS INDEX

Index  $A_d$  = Closing level of VSTOXX index (V2TX) on Index Calculation Day  $d$

Index  $B_d$  = Closing level of VSTOXX120 days index (VSTX120) on Index Calculation Day  $d$ .

- On any Index Calculation Day  $d$  the Target Exposure for Short-Term ( $STE_d$ ) and Mid-Term ( $MTE_d$ ) are calculated based on the Trading Signal calculated on the previous Index Calculation Day ( $TS_{d-1}$ ), according to the tables below.
- On any Index Calculation Day  $d$  the Exposure for Short-Term ( $SE_d$ ) and Mid-Term ( $ME_d$ ) are calculated based on the Target Exposure for Short-Term and Mid-Term for that day ( $STE_d$ ,  $MTE_d$ ), and the Exposure for Short-Term and Mid-Term on the previous day ( $SE_{d-1}$ ,  $ME_{d-1}$ ):

$$SE_d = \begin{cases} \min(STE_d, SE_{d-1} + \text{buffer}) & \text{if } SE_{d-1} < STE_d \\ \max(STE_d, SE_{d-1} - \text{buffer}) & \text{if } SE_{d-1} > STE_d \\ SE_{d-1} & \text{otherwise} \end{cases}$$

$$ME_d = \begin{cases} \min(MTE_d, ME_{d-1} + \text{buffer}) & \text{if } ME_{d-1} < MTE_d \\ \max(MTE_d, ME_{d-1} - \text{buffer}) & \text{if } ME_{d-1} > MTE_d \\ ME_{d-1} & \text{otherwise} \end{cases}$$

Parameter buffer = 5%.

On Index Commencement Date ( $d = 0$ ),  $SE_0 = STE_0$  and  $ME_0 = MTE_0$ .

- On any Index Calculation Day  $d$ , the value of the Excess Return Index at time  $t$  is calculated as:

$$I_t^{ER} = I_R^{ER} \cdot (1 - EC \cdot TO_d) \cdot \left[ 1 + SE_R \cdot \left( \frac{SIU_t}{SIU_R} - 1 \right) + ME_R \cdot \left( \frac{MIU_t}{MIU_R} - 1 \right) - Fee_d \right]$$

|                 |  |
|-----------------|--|
| $R$ (subscript) | = Value of the relevant variable on the immediately preceding Rebalancing Date $R$ , as described in formula 5 |
| $EC$            | = Execution Cost, $EC = 0.10\%$  |
| $TO_d$          | = Turnover on Index Calculation Day $d$ , calculated as in formula 6   |
| $SIU_t$         | = Index Value at time $t$ of the EURO STOXX 50 Volatility Short-Term Futures Index (VST1ME)                    |
| $MIU_t$         | = Index Value at time $t$ of the EURO STOXX 50 Volatility Mid-Term Futures Index (VMT5ME)                      |
| $Fee_d$         | = Total fees on Index Calculation Day $d$ , as calculated in formula 7   |

On Index Commencement Date ( $d = 0$ ),  $I_0^{ER} = 100.00$ .

- An Index Rebalancing Day  $R$  is defined as:
  - » First Index Calculation Day  $d$  of each calendar month, or
  - » Any Index Calculation Day  $d$  on which  $SE_d \neq SE_{d-1}$ , or
  - » Any Index Calculation Day  $d$  on which  $ME_d \neq ME_{d-1}$ , or
  - » Any Index Calculation Day  $d$  on which  $\frac{I_{d-1}^{ER}}{I_R^{ER}} < 0.5$
- On any Index Calculation Day  $d$ , Turnover represents the amount of Short-Term Index Underlying and Mid-Term Index Underlying rebalanced on that day, according to the following formula:

## 4. DYNAMIC VSTOXX NET OF COSTS INDEX

$$TO_d = |SE_d - SE_R| + |ME_d - ME_R|$$

7. The total fees on Index Calculation Day d are comprised of the Index Management Fee and the Replication Cost based on daily exposure:

$$Fee_d = (|SE_R| + |ME_R|) \cdot RC \cdot \frac{days_{R,d}}{365}$$

RC = Replication Cost, RC = 1.00%p.a.

days<sub>R,d</sub> = Number of calendar days between the immediately preceding Rebalancing Day R (excluded) and the current Index Calculation Day d (included).

8. On any Index Calculation Day d, the value of the Total Return Index at time t is calculated as:

$$I_t^{TR} = I_{d-1}^{TR} \cdot \left[ \frac{I_t^{ER}}{I_{d-1}^{ER}} + CR_{d-1} \cdot \frac{days_{d-1,d}}{360} \right]$$

CR<sub>d</sub> = Official Close Value of €STR rate on Index Calculation Day d

days<sub>d-1,d</sub> = Number of actual calendar days between the immediately preceding Index Calculation Day d-1 (excluded) and the current Index Calculation Day d (included)

On Index Commencement Date (d = 0),  $I_0^{ER} = 100.00$ .

### List of Indices / Variants

The Index is calculated in 3 versions and 2 variants for each version:

1. Standard version:
  - c. Dynamic VSTOXX Net of Costs ER, as calculated in step 4
  - d. Dynamic VSTOXX Net of Costs TR, as calculated in step 6
2. Long-Only version:
  - a. Dynamic VSTOXX Long-Only Net of Costs ER, as calculated in step 4
  - b. Dynamic VSTOXX Long-Only Net of Costs TR, as calculated in step 6
3. Alpha version:
  - a. Dynamic VSTOXX Alpha Net of Costs ER, as calculated in step 4
  - b. Dynamic VSTOXX Alpha Net of Costs TR, as calculated in step 6

For the purpose of calculating Target Exposure for Short-Term (STE<sub>d</sub>) and Mid-Term (MTE<sub>d</sub>), the following assignments hold:

### Standard Version

| Trading Signal (TS <sub>d-1</sub> ) | Short-Term Target Exposure (STE <sub>d</sub> ) | Mid-Term Target Exposure (MTE <sub>d</sub> ) |
|-------------------------------------|--|--|
| TS <sub>d-1</sub> < 100%            | -30%   | 70%  |
| 100% ≤ TS <sub>d-1</sub> < 103%     | 0%   | 100%   |
| 103% ≤ TS <sub>d-1</sub> < 110%     | 25%  | 75%  |
| TS <sub>d-1</sub> ≥ 110%            | 50%  | 50%  |

## 4. DYNAMIC VSTOXX NET OF COSTS INDEX

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### Long-Only Version

| Trading Signal ( $TS_{d-1}$ ) | Short-Term<br>( $STE_d$ ) | Target | Exposure | Mid-Term<br>( $MTE_d$ ) | Target | Exposure |
|-------------------------------|---------------------------|--------|----------|-------------------------|--------|----------|
| $TS_{d-1} < 100\%$            | 0%                        |        |          | 0%                      |        |          |
| $100\% \leq TS_{d-1} < 103\%$ | 0%                        |        |          | 50%                     |        |          |
| $103\% \leq TS_{d-1} < 110\%$ | 25%                       |        |          | 75%                     |        |          |
| $TS_{d-1} \geq 110\%$         | 50%                       |        |          | 50%                     |        |          |

### Alpha Version

| Trading Signal ( $TS_{d-1}$ ) | Short-Term<br>( $STE_d$ ) | Target | Exposure | Mid-Term<br>( $MTE_d$ ) | Target | Exposure |
|-------------------------------|---------------------------|--------|----------|-------------------------|--------|----------|
| $TS_{d-1} < 100\%$            | -50%                      |        |          | 50%                     |        |          |
| $100\% \leq TS_{d-1} < 103\%$ | -25%                      |        |          | 75%                     |        |          |
| $103\% \leq TS_{d-1} < 110\%$ | 25%                       |        |          | 75%                     |        |          |
| $TS_{d-1} \geq 110\%$         | 50%                       |        |          | 50%                     |        |          |

For the purpose of calculating Net of Costs variants, the following assignments hold:

Execution Cost:  $EC=0.10\%$

Replication Cost:  $RC=1.00\%$  p.a.

## 5. iSTOXX MUTB INDICES

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### 5.1. iSTOXX MUTB JAPAN QUALITY 150 DAILY HEDGED INDEX

#### 5.1.1. OVERVIEW

A currency-hedged index is designed to represent returns for global index investment strategies that involve hedging currency risk, but not the underlying constituent risk. The currency-hedged strategy indices eliminate the risk of currency fluctuations at the cost of potential currency gains.

The iSTOXX MUTB Japan Quality 150 Daily Hedged index is available in the following types and currencies: price, net and gross return, in EUR.

**Base values and dates:** 100 on June 29, 2001

**Dissemination calendar:** STOXX Global calendar

#### 5.1.2. CALCULATIONS

In the iSTOXX MUTB Japan Quality 150 Daily Hedged index the hedging trade is entered at the end of each calendar month. From that day onwards, the returns of the underlying, unhedged index are integrated by the returns from hedging. The notional amount being hedged is reset on a daily basis.

The full calculation methodology is covered in chapter 18 of the [STOXX Strategy Guide](#).



## 5. iSTOXX MUTB INDICES

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### 5.2. iSTOXX MUTB GLOBAL EX JAPAN QUALITY 150 MONTHLY HEDGED INDEX

#### 5.2.1. OVERVIEW

A currency-hedged index is designed to represent returns for global index investment strategies that involve hedging currency risk, but not the underlying constituent risk. The currency-hedged strategy indices eliminate the risk of currency fluctuations at the cost of potential currency gains.

The iSTOXX MUTB Global ex Japan Quality 150 Monthly Hedged Index is available in the following types and currencies: price, net and gross return, in JPY.

**Base values and dates:** 100 on January 30, 2009

**Dissemination calendar:** STOXX Global calendar

#### 5.2.2. CALCULATIONS

The iSTOXX MUTB Global ex Japan Quality 150 Monthly Hedged Index measures the performance of the iSTOXX MUTB Global ex Japan Quality 150 Monthly Hedged Index while at the same time eliminating foreign currency fluctuations through hedging. The indices therefore combine the performance of the underlying index with a hypothetical, rolling investment into one-month foreign exchange forward contracts. The notional amount being hedged is reset on a monthly basis.

The full calculation methodology is covered in chapter 18 of the [STOXX Strategy Guide](#).

## 5. iSTOXX MUTB INDICES

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### 5.3. iSTOXX MUTB GLOBAL EX AUSTRALIA QUALITY LEADERS 150 MONTHLY HEDGED INDEX

#### 5.3.1. OVERVIEW

A currency-hedged index is designed to represent returns for global index investment strategies that involve hedging currency risk, but not the underlying constituent risk. The currency-hedged strategy indices eliminate the risk of currency fluctuations at the cost of potential currency gains.

The iSTOXX MUTB Global ex Australia Quality Leaders 150 Monthly Hedged Index is available in the following types and currencies: price, net and gross return, in AUD.

**Base values and dates:** 100 on December 31, 2002

**Dissemination calendar:** STOXX Global calendar

#### 5.3.2. CALCULATIONS

The iSTOXX MUTB Global ex Australia Quality Leaders 150 Monthly Hedged Index measures the performance of the iSTOXX MUTB Global ex Australia Quality Leaders 150 Monthly Hedged Index while at the same time eliminating foreign currency fluctuations through hedging. The indices therefore combine the performance of the underlying index with a hypothetical, rolling investment into one-month foreign exchange forward contracts. The notional amount being hedged is reset on a monthly basis.

The full calculation methodology is covered in chapter 18 of the [STOXX Strategy Guide](#).

## 6. EURO iSTOXX 50 FUTURES LEVERAGED INDEX

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### 6.1. EURO iSTOXX 50 FUTURES LEVERAGED INDEX

#### 6.1.1. OVERVIEW

The EURO iSTOXX 50 Futures Leveraged Index is tracking the performance of a 100% position in the EURO STOXX 50® Index combined with 50% exposure in the EURO STOXX 50® Traded Futures Roll Index.

**Rebalancing:** The index is rebalanced on a quarterly basis after the close of the 3rd Friday of March, June, September and December.

**Index types and currencies:** Total Return – Price, Total Return – Net Return, Total Return – Gross Return, Excess Return – Price, Excess Return – Net Return and Excess Return – Gross Return in EUR.

**Dissemination calendar:** STOXX Eurex Calendar

**Base values and dates:** 1000 on Feb 28, 2003

#### 6.1.2. CALCULATION

The EURO iSTOXX 50 Futures Leveraged Index is calculated as follows:

$$IV_t = IV_{reb} \times \left[ 1 + w_1 * \left( \frac{UI_t^1}{UI_{reb}^1} - 1 \right) + w_2 * \left( \frac{UI_t^2}{UI_{reb}^2} - 1 \right) \right]$$

Where,

|                 |   |
|-----------------|---|
| IV              | EURO iSTOXX 50 Futures Leveraged Index                                    |
| UI <sup>1</sup> | EURO STOXX 50® Index (Price, Net or Gross Return)                         |
| UI <sup>2</sup> | EURO STOXX 50® Traded Futures Roll Index (Total or Excess Return)         |
| w <sub>1</sub>  | 100%, the exposure to the EURO STOXX 50® Index                            |
| w <sub>2</sub>  | 50%, the exposure to the EURO STOXX 50® Traded Futures Roll Index         |
| reb             | Rebalancing day (index close value as of 3rd Friday of rebalancing month) |

## 7. EURO iSTOXX 50 DAILY LEVERAGE AND SHORT INDICES

### 7.1. EURO iSTOXX 50 DAILY LEVERAGE AND SHORT INDICES

#### 7.1.1.OVERVIEW

The EURO iSTOXX 50 Daily Leverage/Short indices are innovative index tools that replicate a leverage investment strategy based on the EURO STOXX 50® Index.

Leveraged indices are linked to the changes in the underlying index, applying a leverage factor to movements in the underlying index. Therefore, a positive change of the EURO STOXX 50® Index will result in the corresponding leveraged performance of the EURO iSTOXX 50 Daily Leverage Index compared to the closing level from the last rebalancing.

Short indices are linked inversely to the changes in the underlying index, applying a negative leverage factor to movements in the underlying index. Therefore, investing in the EURO iSTOXX 50 Daily Short Index yields the reverse performance of the EURO STOXX 50® Index, compared to the closing level from the last rebalancing.

#### Index types and currencies:

| Index                         | Return Versions                 | Currency | Leverage (L) |
|-------------------------------|---------------------------------|----------|--------------|
| EURO iSTOXX 50 Daily Leverage | Price, Net Return, Gross Return | EUR, USD | 2            |
| EURO iSTOXX 50 Daily Short    | Price, Net Return, Gross Return | EUR, USD | -1           |

**Base values and dates:** 100,000 as of Jan 31, 2011

**Dissemination calendar:** STOXX Europe calendar

#### 7.1.2.CALCULATION

The EURO iSTOXX 50 Daily Leverage/Short Indices are calculated as follows:

$$IV_t = IV_T \times \left[ 1 + L * \left( \frac{UI_t}{UI_T} - 1 \right) \right]$$

Where,

|    |  |
|----|--|
| IV | EURO iSTOXX 50 Daily Leverage/Short Index  |
| UI | EURO STOXX 50® Index (Price, Net and Gross Return)   |
| L  | Leverage factor (2 for the EURO iSTOXX 50 Daily Leverage Index, -1 for the EURO iSTOXX 50 Daily Short Index) |
| t  | Time of calculation  |
| T  | Time of last rebalancing day prior to t (previous trading day)   |

## 7. EURO ISTOXX 50 DAILY LEVERAGE AND SHORT INDICES

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### 7.1.3. ADJUSTMENTS DUE TO EXTREME MARKET MOVEMENTS

The rebalancing is based on the calculation of average index values over a time window of 10 minutes. The time window to calculate the average starts 5 minutes after and ends 15 minutes after the trigger event occurs. The rebalancing is triggered when the underlying index loses more than x% (leverage index) or appreciates by more than x% (short index) compared to its previous day's close. The breach of the trigger is checked on a tick-by-tick basis. During this time window, the average of both the underlying index (UI) and the Leveraged / Short (IV) index are calculated. The two averages then substitute respectively UIT and IVT in the index calculation formula.

The respective trigger values (x) are:

| Index                         | Trigger value |
|-------------------------------|---------------|
| EURO iSTOXX 50 Daily Leverage | x = -25,00%   |
| EURO iSTOXX 50 Daily Short    | x = 50,00%    |

Over the course of the 10 minute period in which the average is determined, the index is not disseminated. The index dissemination ends 5 minutes after the trigger event and is resumed with an index level equal to the determined average 15 minutes after the trigger event.

Should the intraday rebalancing be triggered less than 15 minutes prior to the end of the index calculation day, the regular overnight rebalancing is carried out.

If the leverage/short index reaches a value of 0, the index is set to a value of 0 and its calculation/dissemination is discontinued. The index suspension is announced immediately, and index is terminated after 20 trading days of suspension.

### 7.1.4. REVERSE SPLIT

If the closing value of a daily leverage or daily short index drops below 100 index points, a reverse split is carried out. The affected leverage or short index is multiplied with a factor of 1000.

The reverse split is carried out based on the index close ten trading days after the index initially dropped below a closing value of 100 points, notwithstanding whether the index rises above a level of 100 points in the meantime.

### 7.1.5. TRADING SUSPENSION

The EURO iSTOXX 50 Daily Leverage and Short indices are calculated on the same days and during the same time as the underlying EURO STOXX 50® Index is calculated.

If there is suspension of the underlying index, the leveraged and short indices will be calculated with the latest prices available.

## 8. EURO iSTOXX 50 QUANTO EURKRW ADJUSTED INDEX

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### 8.1. EURO iSTOXX 50 QUANTO EURKRW ADJUSTED INDEX

#### 8.1.1.OVERVIEW

The EURO iSTOXX 50 Quanto EURKRW Adjusted Index aims to facilitate the pricing of quanto products – a type of derivative in which the underlying is denominated in one currency but the instrument is settled in another currency – in KRW on the EURO STOXX 50.

The index aims to provide an easily replicable variant of the commonly known quanto formula by adjusting the returns of the underlying index, i.e. the EURO STOXX 50, in such a way that they replicate the returns of the quanto formula, using only the returns of the underlying index and the EURKRW exchange rate as inputs.

##### Base values and dates:

- Base date: 31 October 2007
- Base value: 1000
- Underlying Index: EURO STOXX 50 Price EUR
- Index Type: Price
- Index Currency: EUR
- Dissemination Calendar: STOXX Europe Calendar

#### 8.1.2.CALCULATION

$$IDX_t = IDX_{t-1} \cdot \left[ \frac{UND\_IDX_t}{UND\_IDX_{t-1}} + \left( \left( \frac{UND\_IDX_t}{UND\_IDX_{t-2}} - 1 \right) \cdot \left( \frac{FX_t}{FX_{t-1}} - 1 \right) \right) \right]$$

Where

|                      |  |
|----------------------|--|
| IDX                  | index for day t  |
| UND_IDX <sub>t</sub> | underlying index level for day t   |
| FX <sub>t</sub>      | EURKRW <sub>t</sub> rate for day t defined as the product of EURUSD <sub>t</sub> x USDKRW <sub>t</sub> |
| EURUSD <sub>t</sub>  | The Reuters TKFE Tokyo 15:00 fixing at day t, defined as TKFEEUR15=J                                   |
| USDKRW <sub>t</sub>  | The Reuters KFTC30 Korea 15:00 fixing at day t, defined as KRW15H=KFTC                                 |

#### 8.1.3.TRADING SUSPENSION

The EURO iSTOXX 50 Quanto EURKRW Adjusted Index is calculated based on the closing levels of the EURO STOXX 50 Index and the FX fixings on the USDKRW and EURUSD as per the index methodology.

If there is suspension of the underlying data on scheduled trading days or data is unavailable due to holidays for any of the EURO STOXX 50 Index or the FX fixings, the EURO iSTOXX 50 Quanto EURKRW Adjusted Index will be calculated with the latest prices available.

## 9. EURO iSTOXX 50 FUTURES ROLL DAILY LEVERAGE AND SHORT INDICES

### 9.1. EURO iSTOXX 50 FUTURES ROLL DAILY LEVERAGE AND SHORT INDICES

#### 9.1.1.OVERVIEW

The EURO iSTOXX 50 Futures Roll Daily Leverage and EURO iSTOXX 50 Futures Roll Daily Short indices replicate a leveraged investment strategy based on the EURO STOXX 50® Futures Roll Index.

Leveraged indices are linked to the changes in the underlying index, applying a leverage factor to movements in the underlying index. Therefore, a positive change of the EURO STOXX 50® Futures Roll Index will result in the corresponding leveraged performance of the EURO iSTOXX 50 Futures Roll Daily Leverage Index compared to the closing level from the last rebalancing.

Short indices are linked inversely to the changes in the underlying index, applying a negative leverage factor to movements in the underlying index. As a result, investing in the EURO iSTOXX 50 Futures Roll Daily Index yields the reverse performance of the EURO STOXX 50® Futures Roll Index, compared to the closing level from the last rebalancing.

**Index types:**

| Index                                      | Return Versions             | Leverage factor (L) |
|--|-----------------------------|---------------------|
| EURO iSTOXX 50 Futures Roll Daily Leverage | Excess Return, Total Return | 2                   |
| EURO iSTOXX 50 Futures Roll Daily Short    | Excess Return, Total Return | -1                  |

**Underlying index:** EURO STOXX 50® Futures Roll Index

**Base values and dates:** 1000 as of December 29, 2000

**Index currency:** EUR

**Dissemination Calendar:** STOXX Eurex Calendar

#### 9.1.2.CALCULATION

The EURO iSTOXX 50 Daily Leverage/ Short indices are calculated using the daily performance of the EURO STOXX 50 Futures Roll Index as follows:

$$IV_t = IV_{t-1} \times \left[ 1 + L \times \left( \frac{UI_t}{UI_{t-1}} - 1 \right) \right]$$

Where:

## 9. EURO ISTOXX 50 FUTURES ROLL DAILY LEVERAGE AND SHORT INDICES

|           |   |
|-----------|---|
| IV Index) | Leveraged index (EURO iSTOXX 50 Futures Roll Daily Leverage/ Short        |
| UI        | Underlying index (EURO STOXX 50® Futures Roll Index)                      |
| L         | Leverage factor (please see previous table)                               |
| t         | Time of calculation   |
| t-1       | Previous index calculation day (also the last rebalancing day prior to t) |

### 9.1.3. ADJUSTMENTS DUE TO EXTREME MARKET MOVEMENTS

The rebalancing is based on the calculation of average index values over a time window of 10 minutes. The time window to calculate the average starts 5 minutes after and ends 15 minutes after the trigger event occurs. The rebalancing is triggered when the underlying index loses more than x% (leverage index) or appreciates by more than x% (short index) compared to its previous day's close. The breach of the trigger is checked on a tick-by-tick basis. During this time window, the average of both the underlying index (UI) and the Leveraged/ Short index (IV) are calculated. The two averages then substitute respectively  $UI_{t-1}$  and  $IV_{t-1}$  in the index calculation formula.

The respective trigger values (x) are as below:

| Index                                      | Trigger value |
|--|---------------|
| EURO iSTOXX 50 Futures Roll Daily Leverage | x = -25%      |
| EURO iSTOXX 50 Futures Roll Daily Short    | x = 50%       |

Over the course of the 10 minute period in which the average is determined, the index is not disseminated. The index dissemination ends 5 minutes after the trigger event and is resumed with an index level equal to the determined average 15 minutes after the trigger event. Should the intraday rebalancing be triggered less than 15 minutes prior to the end of the index calculation day, the regular overnight rebalancing is carried out. If the leverage/short index reaches a value of 0, the index is set to a value of 0 and its calculation/dissemination is discontinued. The index suspension is announced immediately, and index is terminated after 20 trading days of suspension.

### 9.1.4. REVERSE SPLIT

If the closing value of a daily leverage or daily short index drops below 1 index point, a reverse split is carried out. The affected leverage or short index is multiplied with a factor of 1000.

The reverse split is carried out based on the index close ten trading days after the index initially dropped below a closing value of 1 point, notwithstanding whether the index rises above a level of 1 point in the meantime.

### 9.1.5. TRADING SUSPENSION

If there is suspension of the underlying index, the leveraged and short indices will be calculated with the latest prices available.



## 10. iSTOXX INCREMENT INDICES

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### 10.1. iSTOXX INCREMENT INDICES

#### 10.1.1. OVERVIEW

The Increment Index (see table below) replicates the return of an investment into the Underlying Index (see table below) assuming a constant performance addition per annum. The performance addition accrues constantly on a daily basis. Consequently, due to the percentage of performance addition, the Increment index outperforms the standard net return version of the Underlying Index.

#### 10.1.2. DEFINITIONS

| Index Name                              | Underlying Index                  | Value of the Underlying Index on the base date | Increment Amount |
|---|-----------------------------------|--|------------------|
| EURO iSTOXX 50 NR<br>Increment 0.69%    | EURO STOXX 50 Net Return Index    | 804.28   | 0.69%            |
| iSTOXX Europe 600 NR<br>Increment 0.38% | STOXX EUROPE 600 Net Return Index | 73.56  | 0.38%            |

**Base value:** 100

**Index Currency:** EUR

**Index type:** Net Return

**Base date:** 31 Dec 1986

**Dissemination calendar:** STOXX Europe calendar

#### 10.1.3. CALCULATION

The increment indices listed above are calculated according to the iSTOXX Increment Indices section of the STOXX Strategy Guide.

#### 10.1.4. ONGOING MAINTENANCE

All index changes and adjustments of the Underlying index are reflected in the Increment Index

## 10. iSTOXX INCREMENT INDICES

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### 10.2. EURO iSTOXX EQUAL WEIGHT INCREMENT 7% INDEX

#### 10.2.1. DEFINITIONS

**Base date:** 19 November 2014

**Base Value:** 1000

**Underlying Index:** EURO STOXX 50 Equal Weight EUR GR

**Index Type:** Price

**Index Currency:** EUR

#### 10.2.2. CALCULATION

$$IV_t = IV_{t-1} \frac{U_t}{U_{t-1}} - \text{Fix}_{t-1} \frac{\text{ACT}(t-1, t)}{365}$$

where:

$\text{Fix}_t = \text{Fix}_{t-1} \cdot 1.07^{\frac{\text{ACT}(t-1, t)}{365}}$  for  $t > 0$  (after the base date)

$\text{Fix}_t = 38$  for  $t \leq 0$  (before the base date)

The parameter 38 reflects a dividend yield of 3.8% at the base date and historically, but increases by 7% annually (accrued on a daily basis).

#### 10.2.3. ONGOING MAINTENANCE

All index changes and adjustments of the Underlying index are reflected in the Increment Index

# 11. iSTOXX GLOBAL MILLENNIALS RISK CONTROL 5% RV INDEX

## 11.1. iSTOXX GLOBAL MILLENNIALS RISK CONTROL 5% RV INDEX

### 11.1.1. OVERVIEW

The iSTOXX Global Millennials Risk Control 5% RV index is designed to control the risk profile of the underlying STOXX Global Millennials Index. The iSTOXX Global Millennials Risk Control 5% RV reflects a 5% target volatility strategy. This strategy involves a shift between a risk-free money market investment and a risky portfolio (measured by the STOXX Global Millennials Index). The allocation of the STOXX Risk Control Indices is determined on the basis of the realized volatility of the underlying index.

| Index  | Underlying Index                          | Target Volatility | Currency/Interest Rate | Tolerance | Cap  |
|--|---|-------------------|------------------------|-----------|------|
| iSTOXX Global Millennials Risk Control 5% RV | STOXX Global Millennials USD Gross Return | 5%                | SOFR                   | 5%        | 150% |

**Index types and currencies:** Excess return and Total Return in USD

**Base values and dates:** 100 on September 7, 2012

**Dissemination calendar:** STOXX Europe Calendar

### 11.1.2. INDEX FORMULA

$$TR_t = TR_{t-1} * \left\{ 1 + w_{t-1} * \left( \frac{UI_t}{UI_{t-1}} - 1 \right) + (1 - w_{t-1}) * \left[ IR_{t-1} * \frac{Diff(t-1, t)}{360} \right] \right\}$$

$$ER_t = ER_{t-1} * \left[ 1 - IR_{t-1} * \frac{Diff(t-1, t)}{360} \right] * \left\{ 1 + w_{t-1} * \left( \frac{UI_t}{UI_{t-1}} - 1 \right) + (1 - w_{t-1}) * \left[ IR_{t-1} * \frac{Diff(t-1, t)}{360} \right] \right\}$$

where:

|                |   |
|----------------|---|
| $TR_t$         | iSTOXX Global Millennials Risk Control 5% RV Total Return index level on index level determination date t |
| $w_t$          | Equity Weight on index level determination date t   |
| $UI_t$         | Level of the underlying STOXX index on index level determination date t                                   |
| $IR_t$         | SOFR  |
| $Diff(t-1, t)$ | Difference between t-1 and t measured in calendar days  |

### 11.1.3. DETERMINATION OF THE TARGET WEIGHT

On any Index Level Determination Date t, the Target Weight shall be determined as follows:

## 11. iSTOXX GLOBAL MILLENNIALS RISK CONTROL 5% RV INDEX

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$$Tgtw_t = \frac{5\%}{\text{MaxRealizedVol}_{t,(20,60)}}$$

Where:

$\text{MaxRealizedVol}_{t,(20,60)}$  is the maximum of the realized volatilities measured over 20 and 60 days.

$$\text{RealizedVol}_{t,n} = \sqrt{\frac{252}{n} * \sum_s \left[ \ln\left(\frac{UI_t}{UI_{t-1}}\right) \right]^2}$$

Where:

$n =$  19 (59)

$s =$  ranging from  $t-18$  to  $t$  ( $t-58$  to  $t$ )

### 11.1.4. DETERMINATION OF THE EQUITY WEIGHT AND INDEX REBALANCING DAYS

The Equity Weight on the Index Start Date shall be equal to the Target Weight at the Index Start Date,

$$w_0 = \text{Min}(\text{Cap}, Tgtw_0)$$

On any Index Level Determination Date  $t$  subsequent to the Index Start Date, the Equity Weight shall be determined as follows:

$$(i) \quad \text{If} \quad \text{abs}\left(1 - \frac{w_{t-1}}{Tgtw_{t-1}}\right) > \text{Tolerance}$$

then the Index Level Determination Date  $t$  will be an Index Rebalancing Day and

$$w_t = \text{Min}(\text{Cap}, Tgtw_{t-1})$$

(ii) Otherwise, Index Level Determination Date  $t$  will not be an Index Rebalancing Day and

$$w_t = w_{t-1}$$

where:

**Tolerance** allows a predefined deviation from the target weight, set to 5%

**$w_t$**  Equity Weight on Index Level Determination Date  $t$

**$Tgtw_t$**  Target Weight on Index Level Determination Date  $t$

**Cap** The maximum portion that can be given to the risky asset, set to 150%

## 12. iSTOXX TOP CITYWIRE FUND MANAGERS INDICES

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### 12.1. iSTOXX TOP CITYWIRE FUND MANAGERS RISK CONTROL 8% INDEX

#### 12.1.1. OVERVIEW

The iSTOXX Top Citywire Fund Managers Risk Control 8% Index replicates the performance of a risk control overlay applied to the iSTOXX Top Citywire Top Fund Managers NF Index that targets a volatility of 8% by allocating to both the fund index as well as cash.

In addition, a constant dividend markdown is applied to the index expressed in percent of the index performance that is subtracted on an accrued basis (using an Actual/365 Fixed day count convention). Consequently, due to the percentage of performance being subtracted, the index is underperforming a hypothetical total return index without the decrement deduction.

**Underlying Index:** iSTOXX Top Citywire Fund Managers NF Index

**Base value and date:** 1000 as of February 24, 2009

**Index currency:** EUR

**Return version:** Total Return with cash earning a risk-free rate and 2.5% Decrement

**Target volatility:**  $\sigma_{TV}=8\%$

**Dissemination calendar:** Same as for underlying index

#### 12.1.2. CALCULATION FORMULA

$$IV_t = IV_{t-1} \times \left( 1 + w_{t-1} \times \left( \frac{UL_t}{UL_{t-1}} - 1 \right) + (1 - w_{t-1}) \cdot IR_{t-1} \cdot \frac{d_{t-1,t}}{360} - D \times \frac{d_{t-1,t}}{365} \right)$$

where:

- $w_{t-1}$  = allocation to underlying index effective on day t
- $UL_t$  = index value of underlying index on day t
- $IR_t$  = €STR rate on day t
- $D$  = Decrement amount (2.5%)
- $d_{t-1,t}$  = calendar days between dissemination day t-1 (excluding) and t (including)

#### Volatility Control Calculation Method

On any Index Dissemination Day  $t$ , the returns of the underlying index that are used in the target weight determination are calculated as follows<sup>1</sup>:

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<sup>1</sup> Before inception date of the history of the underlying index its daily returns are defined as  $r_t = \frac{\sigma_{TV}}{\sqrt{252}}$  implying a realized volatility of  $\sigma_{TV}$  and hence an initial allocation to the index of 100%

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## 12. iSTOXX TOP CITYWIRE FUND MANAGERS INDICES

$$r_t = \ln \left( \frac{UL_t}{UL_{t-1}} \right)$$

except between a rebalancing day  $t_{\text{Reb}}$  of the underlying index (including) until N days later. During these days in order to calculate realized volatility based fully on the new composition and weighting all returns used to determine the target volatility are calculated as follows:

$$r_t = \ln \left( \frac{\widetilde{UL}_t}{\widetilde{UL}_{t-1}} \right)$$

$$\widetilde{UL}_t = UL_{t_{\text{Reb}-1}} \cdot \left( \sum_{i \in I} w_{i,t_{\text{Reb}}} \cdot \frac{NAV_{i,t}}{NAV_{i,t_{\text{Reb}-1}}} \right)$$

where:

- N = 30 (counted over index Dissemination Days)
- $t_{\text{Reb}-1}$  = rebalancing day of underlying index immediately preceding  $t_{\text{Reb}}$
- I = set of funds implemented on  $t_{\text{Reb}}$
- $w_{i,t_{\text{Reb}}}$  = weight of fund i as implemented on  $t_{\text{Reb}}$

### Determination of target weight

On any Index Dissemination Day t the target weight is determined as follows:

$$\text{Tgtw}_t = \frac{\sigma_{\text{TV}}}{\sigma_t^N}$$

$$1. \quad \sigma_t^N = \sqrt{\frac{252}{N} \times \sum_{k=0}^{N-1} r_{t-k-\text{Lag}}^2}$$

where:

- N = 30 (counted over index Dissemination Days)
- Lag = 3 (counted over index Dissemination Days)

### Determination of index allocation

On any Index Dissemination Day t, the index weight is determined as follows:

$$w_t^{\text{VC}} = \begin{cases} \min(\text{Cap}, \text{Tgtw}_t) & \text{if } |\text{Tgtw}_t - w_{t-1}^{\text{VC}}| \geq \text{Tol} \\ w_{t-1}^{\text{VC}} & \text{otherwise} \end{cases}$$

where:

- Cap = 100%
- Tol = 5%

## 12. iSTOXX TOP CITYWIRE FUND MANAGERS INDICES

### 12.2. iSTOXX TOP CITYWIRE FUND MANAGERS SELECTION FW RISK CONTROL 5% INDEX

#### 12.2.1. OVERVIEW

The iSTOXX Top Citywire Fund Managers Selection FW Risk Control 5% Index replicates the performance of a risk control overlay applied to the iSTOXX Top Citywire Fund Managers Fixed Weights NF Index that targets a volatility of 5% by allocating to both the fund index as well as cash.

In addition, a constant 2.15% performance deduction per annum is applied to the index: the deduction accrues on a daily basis. Consequently, due to the percentage of performance being subtracted, the index is underperforming a hypothetical index without the decrement deduction. Underlying index: iSTOXX Top Citywire Fund Managers Fixed Weights NF Index (IXCITYFN)

**Index currency:** EUR

**Index base date and value:** 1000 as of February 24, 2009

**Return version:** Total Return with cash earning a risk-free rate and 2.15% Decrement

**Target volatility:**  $\sigma_{TV} = 5\%$

**Dissemination calendar:** Same as underlying index.

#### 12.2.2. CALCULATION FORMULA

The index values are calculated as follows:

$$IV_t = IV_{t-1} \times \left( 1 + w_{t-1} \times \left( \frac{UL_t}{UL_{t-1}} - 1 \right) + (1 - w_{t-1}) \cdot IR_{t-1} \cdot \frac{d_{t-1,t}}{360} - D \times \frac{d_{t-1,t}}{365} \right)$$

where:

|             |   |
|-------------|---|
| $w_{t-1}$   | = allocation to underlying index effective on day t                         |
| $UL_t$      | = index value of underlying index on day t                                  |
| $IR_t$      | = €STR rate on day t  |
| D           | = Decrement amount (2.15%)  |
| $d_{t-1,t}$ | = calendar days between dissemination day t-1 (excluding) and t (including) |

#### Volatility Control Calculation Method

On any Index Dissemination Day t, the returns of the underlying index that are used in the target weight determination are calculated as follows<sup>2</sup>:

<sup>2</sup> Before inception date of the history of the underlying index its daily returns are defined as  $r_t = \frac{\sigma_{TV}}{\sqrt{252}}$  implying a realized volatility of  $\sigma_{TV}$  and hence an initial allocation to the index of 100%

## 12. iSTOXX TOP CITYWIRE FUND MANAGERS INDICES

$$r_t = \ln \left( \frac{UL_t}{UL_{t-1}} \right)$$

except between a rebalancing day  $t_{\text{Reb}}$  of the underlying index (including) until  $N$  days later. During these days in order to calculate realized volatility based fully on the new composition and weighting all returns used to determine the target volatility are calculated as follows:

$$r_t = \ln \left( \frac{\widetilde{UL}_t}{\widetilde{UL}_{t-1}} \right)$$

$$\widetilde{UL}_t = UL_{t_{\text{Reb}-1}} \cdot \left( \sum_{i \in I} w_{i,t_{\text{Reb}}} \cdot \frac{NAV_{i,t}}{NAV_{i,t_{\text{Reb}-1}}} \right)$$

where:

- $N$  = 30 (counted over index Dissemination Days)
- $t_{\text{Reb}-1}$  = rebalancing day of underlying index immediately preceding  $t_{\text{Reb}}$
- $I$  = set of funds implemented on  $t_{\text{Reb}}$
- $w_{i,t_{\text{Reb}}}$  = weight of fund  $i$  as implemented on  $t_{\text{Reb}}$

### Determination of target weight

On any Index Dissemination Day  $t$  the target weight is determined as follows:

$$Tgtw_t = \frac{\sigma_{TV}}{\sigma_t^N}$$

$$\sigma_t^N = \sqrt{\frac{252}{N} \times \sum_{k=0}^{N-1} r_{t-k-Lag}^2}$$

where:

- $N$  = 30 (counted over index Dissemination Days)
- $Lag$  = 3 (counted over index Dissemination Days)

### Determination of the index allocation

On any Index Dissemination Day  $t$ , the index weight is determined as follows:

$$w_t^{VC} = \begin{cases} \min(Cap, Tgtw_t) & \text{if } |Tgtw_t - w_{t-1}^{VC}| \geq Tol \\ w_{t-1}^{VC} & \text{otherwise} \end{cases}$$

where:

- $Cap$  = 100%
- $Tol$  = 5%



## 13. iSTOXX DYNAMIC GOLD HEDGE INDICES

### 13.1. iSTOXX DYNAMIC GOLD HEDGE INDICES

#### 13.1.1. OVERVIEW

The iSTOXX Dynamic Gold Hedge Indices replicate the performance of a dynamic risk control overlay that aims to mitigate downside risk by dynamically allocating equity index exposure to gold in distressed markets. A lower correlation between the two asset classes or a higher relative volatility of equity result in a higher gold exposure.

**Base values and dates:** The following base values and dates apply: 1000 on Jul 13, 2004

**Index types and currencies:** Price in EUR.

| Index name  | Symbol  | Underlying Equity Index               |
|---|---------|---------------------------------------|
| EURO iSTOXX 50 Dynamic Gold Hedge                 | \$X5DUO | EURO STOXX 50 (SX5E)                  |
| EURO iSTOXX Select Dividend 30 Dynamic Gold Hedge | \$D3DUO | EURO STOXX® Select Dividend 30 (SD3E) |

**Dissemination calendar:** The index is calculated on any day, that is a calculation day according to Stoxx Europe Calendar and is not a holiday or a half-trading day in the UK or the 1<sup>st</sup> of May.

#### 13.1.2. CALCULATIONS

**Weighting scheme:** Equity allocation is calculated as follows:

$$w_t = \frac{1}{1 + \min\left(1, \max\left(0, -2 \cdot \rho_{t-1}^{10} \frac{\sigma_{I,t-1}^{10}}{\sigma_{G,t-1}^{10}}\right)\right)}$$

where:

$$\rho_t^N = \frac{\sum_{s=t-N+1}^t r_{I,s} \cdot r_{G,s}}{\sqrt{\sum_{s=t-N+1}^t r_{I,s}^2 \sum_{s=t-N+1}^t r_{G,s}^2}}$$

$$\sigma_t^N = \sqrt{\frac{52}{N} \cdot \sum_{s=t-N+1}^t r_s^2}$$

$$r_t = \ln\left(\frac{p_t}{p_{t-5}}\right)$$

The rest of the index weight is allocated to gold:

$$w_{G,t} = 1 - w_t$$

## 13. iSTOXX DYNAMIC GOLD HEDGE INDICES

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### Calculation Formula:

On any Dissemination Day  $t$ , the index value is calculated as follows:

$$IV_t = IV_{t-1} + q_{I,t-1} \cdot (UL_t - UL_{t-1}) + q_{G,t-1} \cdot (G_t - G_{t-1})$$

With:

$$q_{I,t} = \frac{w_t}{UL_{t-1}} \cdot IV_{t-1}$$

$$q_{G,t} = \frac{w_{G,t}}{G_{t-1}} \cdot IV_{t-1}$$

Where:

|        |   |
|--------|---|
| $IV_t$ | = Index value on day $t$  |
| $UL_t$ | = Value of the underlying equity index on day $t$                   |
| $G_t$  | = Gold mid quote in EUR on day $t$ (RIC: XAUEUR=R) <sup>3,4,5</sup> |

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<sup>3</sup> The end of day index value is calculated using the Gold mid quote at 16:00 CET.

<sup>4</sup> The index values until Mar. 26, 2021 were calculated with the 17:50 CET values. The historical index values until Oct. 24, 2019 were calculated with the 23:00 CET values due to data availability reasons.

<sup>5</sup> XAUEUR=R is a quote-based benchmark. It is used in the closing calculation due to lack of trade-based fixings with a timestamp, that is close to the closing time of the equity index, which would affect replicability of the index.

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# 14. iSTOXX GLOBAL TRANSFORMATION SELECT 30 NR RISK CONTROL 10% INDEX

## 14.1. iSTOXX GLOBAL TRANSFORMATION SELECT 30 NR RISK CONTROL 10% INDEX

### 14.1.1. OVERVIEW

The iSTOXX Global Transformation Select 30 NR Risk Control 10% Index incorporates a target volatility concept. Whereas the risk profile of the underlying index is the uncontrolled outcome of the existing index concept, the Risk Control Index controls for risk by aiming for a defined target volatility level. In order to control for risk, the index shifts between a risk free money market investment and a risky asset (measured by the respective underlying equity index).

**Base Values and Dates:** 100 as of 14 September 2012.

**Underlying Index:** iSTOXX Global Transformation Select 30 EUR Net Return Index

**Index Rounding:** 2 d.p.

**Dissemination Calendar:** STOXX Europe Calendar.

**Index Types and Currencies:** Excess Return in EUR.

### 14.1.2. INDEX REVIEW

The Index Level is determined by:

$$IV_t = IV_{t-1} \cdot \left[ 1 + w_{t-1} \left( \frac{UL_t}{UL_{t-1}} - 1 \right) - w_{t-1} \left( IR_{t-1} \frac{ACT(t-1, t)}{360} \right) \right]$$

Where:

$IV_t$  = Excess Return Index level on index level determination date  $t$

$IV_{t-1}$  = Excess Return Index level on index level determination date  $t-1$  (unrounded value used)

$w_{t-1}$  = Weight allocation to underlying index effective on day  $t-1$

$UL_t$  = Index value of underlying index on day  $t$

$UL_{t-1}$  = Index value of underlying index on day  $t-1$

$IR_{t-1}$  = €STR rate on index level determination date  $t-1$ <sup>6</sup>

$Act(t-1, t)$  = Number of calendar days between calculation day  $t-1$  and calculation day  $t$

The index is to be reported and disseminated rounded to 2 decimal places.

### 14.1.3. DETERMINATION OF THE TARGET WEIGHT

On any Index Level Dissemination Date  $t$ , the Target Weight shall be determined as follows:

<sup>6</sup> The index will be calculated using €STR that is published on day  $T$  in respect of day  $T-1$ , meaning  $€STR_{t-2}$  is used in the above formula.

## 14. iSTOXX GLOBAL TRANSFORMATION SELECT 30 NR RISK CONTROL 10% INDEX

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$$Tgtw_t = \frac{TgtVol}{MaxRealizedVol_{t,(21,63)}}$$

Where  $MaxRealizedVol_{t,(21,63)}$  is the maximum of realized volatilities measured over 21 and 63 days.

$$RealizedVol_{t,n} = \sqrt{\frac{252}{(n-5) \times 5} \cdot \sum_{i=0}^{n-5-1} \left[ \ln \left( \frac{UL_{t-i}}{UL_{t-i-5}} \right) \right]^2}$$

With  $n = 21, 63$ .

### 14.1.4. DETERMINATION OF THE EQUITY WEIGHT AND INDEX REBALANCING DAYS

The index is rebalanced daily and the Equity Weight is calculated as follows:

$$w_t = \text{Min}(\text{Cap}, Tgtw_{t-2})$$

Where: Cap = 150%

## 15. EURO iSTOXX 50 ESG FOCUS MONTHLY KRW HEDGED INDEX

### 15.1. EURO iSTOXX 50 ESG FOCUS MONTHLY KRW HEDGED INDEX

#### 15.1.1. OVERVIEW

The EURO iSTOXX 50 ESG Focus Monthly KRW Hedged Index measures the performance of the EURO iSTOXX 50 ESG Focus Index while at the same time eliminating EURKRW currency fluctuations through hedging. The index, therefore, combines the performance of the underlying index with a hypothetical rolling investment into one-month EURKRW forward contracts. The notional amount being hedged is reset on a monthly basis.

**Base value:** 1000

**Base date:** 29 March 2012

**Underlying Index:** EURO iSTOXX 50 ESG Focus EUR Price (SX5EFE)

**Index type:** Price

**Index Currency:** KRW

**Dissemination calendar:** STOXX Europe Calendar

#### 15.1.2. CALCULATION

$$H\_IDX_t = H\_IDX_{t_r} \cdot \left[ \frac{UH\_IDX_t}{UH\_IDX_{t_r}} + \frac{H\_IDX_{t_{r-1}}}{H\_IDX_{t_r}} \cdot HR_{t_r} \cdot \left( \frac{FX_{t_{r-1}}}{FF_{t_r}} - \frac{FX_{t_{r-1}}}{IFF_t} \right) \right]$$

Where:

|                     |  |
|---------------------|--|
| $H\_IDX_t$          | hedged index value for day $t$   |
| $UH\_IDX_t$         | unhedged reference index in KRW for day $t$ , equivalent to the underlying index level for day $t$ divided by $FX_t$                                     |
| $t_r$               | last calculation day of preceding month (reset date)   |
| $t$                 | day of index calculation / number of calendar days since $t_r$   |
| $T$                 | number of calendar days in current month   |
| $HR$                | hedge ratio of currency hedge, $HR_{t_r} = 100\%$  |
| $FX_t$              | spot currency rate for day $t$ , (1/EURKRW <sub><math>t</math></sub> )   |
| $FF_t$              | 1-month forward currency rate for day $t$ , 1/(EURKRW_1M_Fwd <sub><math>t</math></sub> )   |
| $IFF_t$             | interpolated forward currency rate for day $t$ expressed as units of EUR per unit KRW, $IFF_t = FX_t + \left(1 - \frac{t}{T}\right) \cdot (FF_t - FX_t)$ |
| $EURKRW_t$          | units of KRW per unit EUR, obtained using WM Fixing of 6AM GMT   |
| $EURKRW\_1M\_Fwd_t$ | 1-month NDF rate, expressed as units of KRW per unit EUR, obtained using WM Fixing of 6AM GMT  |

## 16. EURO iSTOXX 50 FUTURES ROLL TR KRW HEDGED (MONTHLY) INDEX

### 16.1. EURO iSTOXX 50 FUTURES ROLL TR KRW HEDGED (MONTHLY) INDEX

#### 16.1.1. OVERVIEW

The EURO iSTOXX 50 Futures Roll TR KRW Hedged (Monthly) Index measures the performance of the EURO STOXX 50 Futures Roll 5D TR Index while at the same time eliminating EURKRW currency fluctuations through hedging. The index, therefore, combines the performance of the underlying index with a hypothetical rolling investment into one-month EURKRW forward contracts. The notional amount being hedged is reset on a monthly basis.

**Base value:** 1000

**Base date:** 31 March 2011

**Underlying Index:** EURO STOXX 50 Futures Roll 5D TR EUR (SX5EF5TR)

**Index type:** Price

**Index Currency:** KRW

**Dissemination calendar:** STOXX Eurex Calendar

**Derived indices:** The EURO iSTOXX 50 Futures Roll TR KRW Hedged (Monthly) Index serves as input for the EURO iSTOXX 50 Futures Roll TR KRW Hedged (Monthly) Decrement 3.5% Index

#### 16.1.2. CALCULATION

$$H\_IDX_t = H\_IDX_{t_r} \cdot \left[ \frac{UH\_IDX_t}{UH\_IDX_{t_r}} + \frac{H\_IDX_{t_r-1}}{H\_IDX_{t_r}} \cdot HR_{t_r} \cdot \left( \frac{FX_{t_r-1}}{FF_{t_r}} - \frac{FX_{t_r-1}}{IFF_t} \right) \right]$$

Where:

|                     |  |
|---------------------|--|
| $H\_IDX_t$          | hedged index value for day t   |
| $UH\_IDX_t$         | unhedged reference index in KRW for day t, equivalent to the underlying index level for day t divided by $FX_t$  |
| $t_r$               | last calculation day of preceding month (reset date)   |
| t                   | day of index calculation / number of calendar days since $t_r$   |
| T                   | number of calendar days in current month   |
| HR                  | hedge ratio of currency hedge, $HR_{t_r} = 100\%$  |
| $FX_t$              | spot currency rate for day t, (1/EURKRW <sub>t</sub> )   |
| $FF_t$              | 1-month forward currency rate for day t, 1/(EURKRW_1M_Fwd <sub>t</sub> )   |
| $IFF_t$             | interpolated forward currency rate for day t expressed as units of EUR per unit KRW, $IFF_t = FX_t + \left(1 - \frac{t}{T}\right) \cdot (FF_t - FX_t)$ |
| $EURKRW_t$          | units of KRW per unit EUR, obtained using WM Fixing of 6AM GMT   |
| $EURKRW\_1M\_Fwd_t$ | 1-month NDF rate, expressed as units of KRW per unit EUR, obtained using WM Fixing of 6AM GMT  |

# 17. EURO iSTOXX 50 ESG KRW-CONVERTED DAILY RESET INDEX

## 17.1. EURO iSTOXX 50 ESG KRW-CONVERTED DAILY RESET INDEX

### 17.1.1. OVERVIEW

The EURO iSTOXX 50 ESG KRW-converted Daily Reset Index is designed as a base for structured products in KRW. The index is settled in KRW, while its underlying index, the EURO STOXX 50 ESG Index, is denominated in EUR. The EURO iSTOXX 50 ESG KRW-converted Daily Reset Index is designed to limit FX risk and offer a replicable strategy that accounts for the execution lag between different time zones.

**Base date:** 19 March 2012

**Base value:** 1000

**Underlying Index:** EURO STOXX 50 ESG Price EUR (SX5EESG)

**Index type:** Price

**Index Currency:** KRW

**Dissemination calendar:** STOXX Europe Calendar

### 17.1.2. CALCULATIONS

$$IDX_t = IDX_{t-1} \cdot \left( \frac{U\_IDX_t \cdot FX_t}{U\_IDX_{t-1} \cdot FX_{t-1}} \right) + IDX_{t-2} \cdot \left( \frac{FX_{t-1} - FX_t}{FX_{t-2}} \right)$$

Where

|            |  |
|------------|--|
| $IDX_t$    | index for day t  |
| $U\_IDX_t$ | underlying index level for day t, SX5EESG <sub>t</sub>         |
| $FX_t$     | spot currency rate for day t, EURKRW <sub>t</sub>              |
| $EURKRW_t$ | units of KRW per unit EUR, obtained using WM Fixing of 6AM GMT |

### 17.1.3. TRADING SUSPENSION

The EURO iSTOXX 50 ESG KRW-converted Daily Reset Index is calculated based on the closing levels of the EURO STOXX 50 ESG Index and the FX fixings on the EURKRW as per the index methodology.

If there is suspension of the underlying data on scheduled trading days or data is unavailable due to holidays for any of the EURO STOXX 50 ESG Index or the FX fixings, the EURO iSTOXX 50 ESG KRW-converted Daily Reset Index will be calculated with the latest prices available

## 18. iSTOXX VIETNAM FUTURES ROLL KR INDICES

### 18.1. iSTOXX VIETNAM FUTURES ROLL KR INDICES

#### 18.1.1. INDEX CONCEPT

The iSTOXX Vietnam Futures Roll KR Indices replicate the return of a portfolio rolling the first nearby VN30 Index Future contract into the second nearby contract over the period of 3 days. In addition, the return of a risk-free component is included. Leveraged and inverse versions are available.

**Index types and currencies:** VND Total Return

**Base values and dates:** 100,000 on October 19, 2018

**Dissemination calendar:** Trading calendar of VN30 index futures<sup>7</sup>

**Precision:** Index values are rounded to 2 decimals.

#### 18.1.2. CALCULATIONS

$$IV_t = IV_{t-1} \left( 1 + L \cdot \left( w_{1,t-1} \frac{F_{1,t}}{F_{1,t-1}} + w_{2,t-1} \frac{F_{2,t}}{F_{2,t-1}} - 1 \right) + (1 - |L| \cdot MR) \cdot IR_{t-1} \frac{d}{365} \right)$$

Where,

- $IV_t$  = index value on day  $t$
- $L$  = leverage (1, 2, -1, -2)
- $w_{k,t}$  = weight of  $k^{\text{th}}$  VN30 futures contract on close of day  $t$
- $F_{k,t}$  = settlement price of  $k^{\text{th}}$  VN30 futures contract on day  $t$  (mid quote for real-time calculation)
- $MR$  = margin rate<sup>8</sup>
- $IR_t$  = Korean Overnight Call Rate (RIC: KRCALL=BOKK) on day  $t$
- $d$  = number of calendar days between day  $t$  and day  $t-1$

Weight calculation:

$$w_{1,t} = \left( 1 - \frac{r}{3} \right)$$

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

Where

- $r$  = roll day (1 on T-3, 2 on T-2, 3 on T-1, 0 otherwise)

<sup>7</sup> <https://hnx.vn/tin-tuc-su-kien-gd.html>

<sup>8</sup> Changes to the margin rate as published by HNX may not be applied to the index formula immediately; currently set to 13%



## 18. iSTOXX VIETNAM FUTURES ROLL KR INDICES

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$T$  = Final trading day of 1<sup>st</sup> contract (typically the third Thursday of the expiry month. In case it is a holiday, it will be the previous trading day)

I.e. on the final trading day of the 1<sup>st</sup> contract the index return is solely based on the 2<sup>nd</sup> contract.

# 19. EURO iSTOXX 50 INFLATION ADJUSTED INDEX

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## 19.1. EURO iSTOXX 50 PR INFLATION ADJUSTED INDEX

### 19.1.1. INDEX CONCEPT

The EURO iSTOXX 50 PR Inflation Adjusted Index measures the performance of the Price Return version of the EURO STOXX 50 Index while taking into account inflation in the Eurozone. This is done by incorporating the changing levels of the Harmonised Index of Consumer Prices into the calculation.

**Index Type and Currency:** Price Return, EUR.

**Index Rounding:** Index values rounded to 2dp

**Base Value and Date:** 100 on 02 Jan 2006

**Dissemination calendar:** STOXX Europe calendar

### 19.1.2. INDEX FORMULA

The Index values are calculated as follows:

$$I_t = I_{t-1} * \left[ \frac{SX5E_t}{SX5E_{t-1}} \right] * \left[ \frac{CPI_{Month(t-1)-3}}{CPI_{Month(t)-3}} \right]$$

With:

|                      |   |
|----------------------|---|
| $I_t$                | Index value on day t  |
| $I_{t-1}$            | Index value on day t-1 (Unrounded value used)   |
| $SX5E_t$             | Index SX5E value on day t   |
| $SX5E_{t-1}$         | Index SX5E value on day t-1   |
| $CPI_{Month(t)-3}$   | Index CPI value for the 3rd month in the past (3 months from the current one)                   |
| $CPI_{Month(t-1)-3}$ | Index CPI value for the 3rd month in the past (3 months from the month of the Business Day t-1) |

Where,

SX5E: EURO Stoxx 50 Index (Price Return)

CPI: Eurostat Euro Zone HICP Excluding Tobacco (on Refinitiv EUCPTU=ECI)

### 19.1.3. ONGOING MAINTENANCE

All corporate actions and events handled in the EURO STOXX 50 Index (Price Return) – no additional precautions needed

## 19. EURO iSTOXX 50 INFLATION ADJUSTED INDEX

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### 19.2. EURO iSTOXX 50 NR INFLATION ADJUSTED INDEX

#### 19.2.1. INDEX CONCEPT

The EURO iSTOXX 50 NR Inflation Adjusted Index measures the performance of the Net Return version of the EURO STOXX 50 Index while taking into account inflation in the Eurozone. This is done by incorporating the changing levels of the Harmonised Index of Consumer Prices into the calculation.

**Index Type and Currency:** Net Return, EUR.

**Index Rounding:** Index values rounded to 2dp

**Base Value and Date:** 100 on 02 Jan 2006

**Dissemination calendar:** STOXX Europe calendar

#### 19.2.2. INDEX FORMULA

The Index values are calculated as follows:

$$I_t = I_{t-1} * \left[ \frac{SX5T_t}{SX5T_{t-1}} \right] * \left[ \frac{CPI_{Month(t-1)-3}}{CPI_{Month(t)-3}} \right]$$

With:

|                      |   |
|----------------------|---|
| $I_t$                | Index value on day t  |
| $I_{t-1}$            | Index value on day t-1 (Unrounded value used)   |
| $SX5T_t$             | Index SX5T value on day t   |
| $SX5T_{t-1}$         | Index SX5T value on day t-1   |
| $CPI_{Month(t)-3}$   | Index CPI value for the 3 <sup>rd</sup> month in the past (3 months from the current one)                   |
| $CPI_{Month(t-1)-3}$ | Index CPI value for the 3 <sup>rd</sup> month in the past (3 months from the month of the Business Day t-1) |

Where,

**SX5T:** EURO Stoxx 50 Index (Net Return)

**CPI:** Eurostat Euro Zone HICP Excluding Tobacco (on Refinitiv EUCPTU=ECI) (sponsor of the index Eurostat)

#### 19.2.3. ONGOING MAINTENANCE

All corporate actions and events handled in the EURO STOXX 50 Index (Price Return) – no additional precautions needed

## 20. iSTOXX ON SINGLE STOCK INDICES

### 20.1. iSTOXX ON SINGLE STOCK INDICES

#### 20.1.1. OVERVIEW

The indices are weighted according to free-float market capitalization, as described in the STOXX Calculation. The indices are composed of one constituent, except in the event of spin-offs, in which case the spun-off company is added for one day before being removed.

#### 20.1.2. DEFINITIONS

| Index Name  | Symbol   | Base value | Calendar              | Base Date       | Index Type   | Index Currency |
|---|----------|------------|-----------------------|-----------------|--------------|----------------|
| iSTOXX Single Stock on BNP Paribas Gross Return EUR     | IXBNPGR  | 10000      | STOXX Europe Calendar | 19 January 2022 | Gross Return | EUR            |
| iSTOXX Single Stock on Credit Agricole Gross Return EUR | IXACAGR  | 10000      | STOXX Europe Calendar | 19 January 2022 | Gross Return | EUR            |
| iSTOXX Single Stock on Saint Gobain Gross Return EUR    | IXSGOGR  | 10000      | STOXX Europe Calendar | 19 January 2022 | Gross Return | EUR            |
| iSTOXX Single Stock on Vinci Gross Return EUR           | IXDGGR   | 10000      | STOXX Europe Calendar | 19 January 2022 | Gross Return | EUR            |
| iSTOXX Single Stock on BMW Gross Return EUR             | IXBMWGR  | 10000      | STOXX Europe Calendar | 19 January 2022 | Gross Return | EUR            |
| iSTOXX Single Stock on Volkswagen Gross Return EUR      | IXVOW3GR | 10000      | STOXX Europe Calendar | 19 January 2022 | Gross Return | EUR            |
| iSTOXX Single Stock on Daimler Gross Return EUR         | IXDAIGR  | 10000      | STOXX Europe Calendar | 19 January 2022 | Gross Return | EUR            |
| iSTOXX Single Stock on Hermes Gross Return EUR          | IXRMSGR  | 10000      | STOXX Europe Calendar | 05 March 2021   | Gross Return | EUR            |
| iSTOXX Single Stock on Sanofi Gross Return EUR          | IXSANGR  | 10000      | STOXX Europe Calendar | 05 March 2021   | Gross Return | EUR            |
| iSTOXX Single Stock on Pernod Ricard Gross Return EUR   | IXRIGR   | 10000      | STOXX Europe Calendar | 05 March 2021   | Gross Return | EUR            |
| iSTOXX Single Stock on Total Gross Return EUR           | IXTTEGR  | 10000      | STOXX Europe Calendar | 05 March 2021   | Gross Return | EUR            |
| iSTOXX Single Stock on Nestle Gross Return CHF          | IXNESNGR | 10000      | STOXX Europe Calendar | 05 March 2021   | Gross Return | CHF            |
| iSTOXX Single Stock on Roche Gross Return CHF           | IXROGGR  | 10000      | STOXX Europe Calendar | 05 March 2021   | Gross Return | CHF            |
| iSTOXX Single Stock on Siemens Gross Return EUR         | IXSIEGR  | 10000      | STOXX Europe Calendar | 05 March 2021   | Gross Return | EUR            |
| iSTOXX Single Stock on Allianz Gross Return EUR         | IXALVGR  | 10000      | STOXX Europe Calendar | 05 March 2021   | Gross Return | EUR            |
| iSTOXX Single Stock on Eni Gross Return EUR             | IXENIGR  | 10000      | STOXX Europe Calendar | 05 March 2021   | Gross Return | EUR            |
| iSTOXX Single Stock on JPM Gross Return USD             | IXJPMGR  | 10000      | STOXX US Calendar     | 05 March 2021   | Gross Return | USD            |
| iSTOXX Single Stock on Intel Gross Return USD           | IXINTCGR | 10000      | STOXX US Calendar     | 05 March 2021   | Gross Return | USD            |
| iSTOXX Single Stock on Volvo Gross Return SEK           | IXVOLVGR | 10000      | STOXX Europe Calendar | 05 March 2021   | Gross Return | SEK            |
| iSTOXX Single Stock on Engie Gross Return EUR           | IXENGIGR | 10000      | STOXX Europe Calendar | 05 July 2021    | Gross Return | EUR            |
| iSTOXX Single Stock on Orange Gross Return EUR          | IXORAGR  | 10000      | STOXX Europe Calendar | 05 July 2021    | Gross Return | EUR            |
| iSTOXX Single Stock on AXA Gross Return EUR             | IXCSGR   | 10000      | STOXX Europe Calendar | 05 July 2021    | Gross Return | EUR            |
| iSTOXX Single Stock on Danone Gross Return EUR          | IXBNGR   | 10000      | STOXX Europe Calendar | 05 July 2021    | Gross Return | EUR            |
| iSTOXX Single Stock on BBVA Gross Return EUR            | IXBBVAGR | 10000      | STOXX Europe Calendar | 05 July 2021    | Gross Return | EUR            |

## 20. iSTOXX ON SINGLE STOCK INDICES

|   |           |       |                       |                 |              |     |
|---|-----------|-------|-----------------------|-----------------|--------------|-----|
| iSTOXX Single Stock on British American Tobacco Gross Return GBP    | IXBATSGR  | 10000 | STOXX Europe Calendar | 05 July 2021    | Gross Return | GBP |
| iSTOXX Single Stock on Royal Dutch Shell Gross Return EUR           | IXRDSAGR  | 10000 | STOXX Europe Calendar | 05 July 2021    | Gross Return | EUR |
| iSTOXX Single Stock on BASF Gross Return EUR                        | IXBASFGGR | 10000 | STOXX Europe Calendar | 05 July 2021    | Gross Return | EUR |
| iSTOXX Single Stock on Bayer Gross Return EUR                       | IXBAYNGR  | 10000 | STOXX Europe Calendar | 05 July 2021    | Gross Return | EUR |
| iSTOXX Single Stock on Bouygues Gross Return EUR                    | IXENGR    | 10000 | STOXX Europe Calendar | 05 July 2021    | Gross Return | EUR |
| iSTOXX Single Stock on Société Générale Gross Return EUR            | IXGLEGR   | 10000 | STOXX Europe Calendar | 19 January 2022 | Gross Return | EUR |
| iSTOXX Single Stock on Leonardo Gross Return EUR                    | IXLDOGR   | 10000 | STOXX Europe Calendar | 05 March 2021   | Gross Return | EUR |
| iSTOXX Single Stock on Unicredit Gross Return EUR                   | IXUCGGR   | 10000 | STOXX Europe Calendar | 05 March 2021   | Gross Return | EUR |
| iSTOXX Single Stock on UBS Gross Return CHF                         | IXUBSGGR  | 10000 | STOXX Europe Calendar | 05 March 2021   | Gross Return | CHF |
| iSTOXX Single Stock on H & M Hennes & Mauritz Gross Return SEK      | IXHMBGR   | 10000 | STOXX Europe Calendar | 05 March 2021   | Gross Return | SEK |
| iSTOXX Single Stock on SSAB Gross Return SEK                        | IXSSABGR  | 10000 | STOXX Europe Calendar | 05 March 2021   | Gross Return | SEK |
| iSTOXX Single Stock on Swedbank Gross Return SEK                    | IXSWEDGR  | 10000 | STOXX Europe Calendar | 05 March 2021   | Gross Return | SEK |
| iSTOXX Single Stock on Deutsche Post Gross Return EUR               | IXDPWGR   | 10000 | STOXX Europe Calendar | 05 March 2021   | Gross Return | EUR |
| iSTOXX Single Stock on Novartis Gross Return CHF                    | IXNOVNGR  | 10000 | STOXX Europe Calendar | 05 March 2021   | Gross Return | CHF |
| iSTOXX Single Stock on Intesa Sanpaolo Gross Return EUR             | IXISPGR   | 10000 | STOXX Europe Calendar | 05 March 2021   | Gross Return | EUR |
| iSTOXX Single Stock on Repsol Gross Return EUR                      | IXREGR    | 10000 | STOXX Europe Calendar | 05 July 2021    | Gross Return | EUR |
| iSTOXX Single Stock on Telefonica Gross Return EUR                  | IXTEFGR   | 10000 | STOXX Europe Calendar | 05 July 2021    | Gross Return | EUR |
| iSTOXX Single Stock on BP Gross Return GBP                          | IXBPGR    | 10000 | STOXX Europe Calendar | 05 July 2021    | Gross Return | GBP |
| iSTOXX Single Stock on Zurich Insurance Gross Return CHF            | IXZURNGR  | 10000 | STOXX Europe Calendar | 31 March 2022   | Gross Return | CHF |
| iSTOXX Single Stock on Swiss Re Gross Return CHF                    | IXSRENGR  | 10000 | STOXX Europe Calendar | 31 March 2022   | Gross Return | CHF |
| iSTOXX Single Stock on Swiss Life Gross Return CHF                  | IXSLHNGR  | 10000 | STOXX Europe Calendar | 31 March 2022   | Gross Return | CHF |
| iSTOXX Single Stock on Stellantis Gross Return EUR                  | IXSTLGR   | 10000 | STOXX Europe Calendar | 05 May 2022     | Gross Return | EUR |
| iSTOXX Single Stock on Enel Gross Return EUR                        | IXENELGR  | 10000 | STOXX Europe Calendar | 30 May 2022     | Gross Return | EUR |
| iSTOXX Single Stock on Mediobanca Banca di Credito Gross Return EUR | IXMBGR    | 10000 | STOXX Europe Calendar | 30 May 2022     | Gross Return | EUR |
| iSTOXX Single Stock on Poste Italiane Gross Return EUR              | IXPSTGR   | 10000 | STOXX Europe Calendar | 30 May 2022     | Gross Return | EUR |
| iSTOXX Single Stock on Assicurazioni Generali Gross Return EUR      | IXGGR     | 10000 | STOXX Europe Calendar | 30 May 2022     | Gross Return | EUR |
| iSTOXX Single Stock on Bank Polska Kasa Opieki Gross Return PLN     | IXPEOGR   | 10000 | STOXX Europe Calendar | 30 May 2022     | Gross Return | PLN |
| iSTOXX Single Stock on Kering Gross Return EUR                      | IXKERGR   | 10000 | STOXX Europe Calendar | 22 August 2022  | Gross Return | EUR |
| iSTOXX Single Stock on CGDE Michelin Gross Return EUR               | IXMLGR    | 10000 | STOXX Europe Calendar | 22 August 2022  | Gross Return | EUR |
| iSTOXX Single Stock on Carrefour Gross Return EUR                   | IXCAGR    | 10000 | STOXX Europe Calendar | 22 August 2022  | Gross Return | EUR |
| iSTOXX Single Stock on Veolia Gross Return EUR                      | IXVIEGR   | 10000 | STOXX Europe Calendar | 22 August 2022  | Gross Return | EUR |
| iSTOXX Single Stock on Anglo American Gross Return GBP              | IXAALGR   | 10000 | STOXX Europe Calendar | 10 January 2023 | Gross Return | GBP |

## 20. iSTOXX ON SINGLE STOCK INDICES

|  |          |       |                       |                 |              |     |
|--|----------|-------|-----------------------|-----------------|--------------|-----|
| iSTOXX Single Stock on ABN AMRO Bank Gross Return EUR      | IXABNGR  | 10000 | STOXX Europe Calendar | 10 January 2023 | Gross Return | EUR |
| iSTOXX Single Stock on Aegon Gross Return EUR              | IXAGNGR  | 10000 | STOXX Europe Calendar | 10 January 2023 | Gross Return | EUR |
| iSTOXX Single Stock on Banco BPM Gross Return EUR          | IXBAMIGR | 10000 | STOXX Europe Calendar | 10 January 2023 | Gross Return | EUR |
| iSTOXX Single Stock on BPER Banca Gross Return EUR         | IXBPEGR  | 10000 | STOXX Europe Calendar | 10 January 2023 | Gross Return | EUR |
| iSTOXX Single Stock on ING Gross Return EUR                | IXINGAGR | 10000 | STOXX Europe Calendar | 10 January 2023 | Gross Return | EUR |
| iSTOXX Single Stock on ArcelorMittal Gross Return EUR      | IXMTGR   | 10000 | STOXX Europe Calendar | 10 January 2023 | Gross Return | EUR |
| iSTOXX Single Stock on Rio Tinto Gross Return GBP          | IXRIOGR  | 10000 | STOXX Europe Calendar | 10 January 2023 | Gross Return | GBP |
| iSTOXX Single Stock on RWE Gross Return EUR                | IXRWEGR  | 10000 | STOXX Europe Calendar | 10 January 2023 | Gross Return | EUR |
| iSTOXX Single Stock on Tenaris Gross Return EUR            | IXTENGR  | 10000 | STOXX Europe Calendar | 10 January 2023 | Gross Return | EUR |
| iSTOXX Single Stock on Klepierre Gross Return EUR          | IXLIGR   | 10000 | STOXX Europe Calendar | 10 January 2023 | Gross Return | EUR |
| iSTOXX Single Stock on Ferrari Gross Return EUR            | IXRACEGR | 10000 | STOXX Europe Calendar | 3 May 2023      | Gross Return | EUR |
| iSTOXX Single Stock on SCOR Gross Return EUR               | IXSCORGR | 10000 | STOXX Europe Calendar | 19 June 2023    | Gross Return | EUR |
| iSTOXX Single Stock on FincoBank Gross Return EUR          | IXFBKGR  | 10000 | STOXX Europe Calendar | 19 June 2023    | Gross Return | EUR |
| iSTOXX Single Stock on STMicroelectronics Gross Return EUR | IXSTMIGR | 10000 | STOXX Europe Calendar | 7 July 2023     | Gross Return | EUR |

If the underlying stock of a single stock index is delisted, then the respective single stock index will be terminated.

## 21. EURO iSTOXX FUTURES LEVERAGE INDICES

### 21.1. EURO iSTOXX FUTURES LEVERAGE INDICES

#### 21.1.1. OVERVIEW

The EURO iSTOXX Futures Leverage Long and Short Indices replicate a leveraged investment strategy based on the EURO STOXX Futures Switch ER Indices. Leveraged long indices apply a leverage factor to movements in the underlying index. Therefore, a positive change of the underlying index will result in the corresponding leveraged performance in this index. Short indices are linked inversely to the changes in the underlying index, applying a negative leverage factor to movements in the underlying index. Therefore, investing in short indices yields the reverse performance of the underlying index.

**Index types and currencies:** Excess Return in EUR.

**Base values and dates:** See table below.

**Dissemination calendar:** STOXX Eurex Calendar

**Index Rounding :** 3 d.p.

| ISIN         | Index Name  | Underlying Index | Leverage Factor | Base Value | Base Date  |
|--------------|---|------------------|-----------------|------------|------------|
| CH1169655565 | EURO iSTOXX 50 Futures Leverage Long 5X               | SX5EFSE          | 5               | 1000       | 22/08/2022 |
| CH1169655573 | EURO iSTOXX 50 Futures Leverage Short 5X              | SX5EFSE          | -5              | 1000       | 22/08/2022 |
| CH1169655607 | EURO iSTOXX 50 Futures Leverage Long 7X               | SX5EFSE          | 7               | 1000       | 12/09/2022 |
| CH1169655615 | EURO iSTOXX 50 Futures Leverage Short 7X              | SX5EFSE          | -7              | 1000       | 12/09/2022 |
| CH1169655623 | EURO iSTOXX Banks Futures Leverage Long 7X            | SX7EFSE          | 7               | 1000       | 12/09/2022 |
| CH1169655649 | EURO iSTOXX Oil & Gas Futures Leverage Long 7X        | SXESE            | 7               | 1000       | 12/09/2022 |
| CH1169655656 | EURO iSTOXX Oil & Gas Futures Leverage Short 7X       | SXESE            | -7              | 1000       | 12/09/2022 |
| CH1169655706 | EURO iSTOXX Banks Futures Leverage Long 5X            | SX7EFSE          | 5               | 1000       | 06/10/2022 |
| CH1169655714 | EURO iSTOXX Banks Futures Leverage Short 5X           | SX7EFSE          | -5              | 1000       | 06/10/2022 |
| CH1169655722 | EURO iSTOXX Oil & Gas Futures Leverage Long 5X        | SXESE            | 5               | 1000       | 06/10/2022 |
| CH1169655730 | EURO iSTOXX Oil & Gas Futures Leverage Short 5X       | SXESE            | -5              | 1000       | 06/10/2022 |
| CH1169655789 | iSTOXX Europe 600 Oil & Gas Futures Leverage Long 5X  | SXEPSE           | 5               | 1000       | 02/12/2022 |
| CH1169655797 | iSTOXX Europe 600 Oil & Gas Futures Leverage Short 5X | SXEPSE           | -5              | 1000       | 02/12/2022 |
| CH1169655805 | iSTOXX Europe 600 Oil & Gas Futures Leverage Long 7X  | SXEPSE           | 7               | 1000       | 02/12/2022 |

## 21. EURO ISTOXX FUTURES LEVERAGE INDICES

|              |  |          |    |      |            |
|--------------|--|----------|----|------|------------|
| CH1169655813 | iSTOXX Europe 600 Oil & Gas Futures Leverage<br>Short 7X | SXEPF5ER | -7 | 1000 | 02/12/2022 |
|--------------|--|----------|----|------|------------|

### 21.1.2. CALCULATION

The formula can be written as:

$$\text{LevIDX}_t = \text{LevIDX}_T \cdot \left[ 1 + L \cdot \left( \frac{\text{IDX}_t}{\text{IDX}_T} - 1 \right) + (IR + L \cdot c_M \cdot a) \cdot \frac{d}{360} \right]$$

where:

- LevIDX = Leverage Index (Rounded previous value used for calculation).
- IDX = Underlying Index.
- IR = Interest Rate (€STR(t-2) is used).
- $c_M$  = Cost of Borrow (Fixed at 0.6%).
- $t$  = Time of calculation.
- $T$  = Time of last rebalancing prior to  $t$  (Usually last trading day).
- $d$  = Number of calendar days between  $t$  and  $T$ .
- $L$  = Leverage Factor.
- $a$  = -1 for Long Indices, 1 for Short Indices.

#### Adjustments Due to Extreme Market Movements

The intraday rebalancing is based on the minimum/maximum overall index values that occur in a time window of 10 minutes  $[\theta, \theta^+]$ . The time window to calculate the minimum/maximum starts immediately after the trigger event occurs  $[\theta]$ . The intraday rebalancing is triggered when the underlying index decreases more than  $x\%$  (long indices) or increases by more than  $x\%$  (short indices) compared to its previous day's close.

The respective trigger values ( $x$ ) are given in the following table:

| Long     |               | Short    |               |
|----------|---------------|----------|---------------|
| Leverage | Trigger Value | Leverage | Trigger Value |
| 5        | -14%          | -5       | 14%           |
| 7        | -11%          | -7       | 11%           |

Within the intraday rebalancing process, the base value when the minimum/maximum occurs in time  $t^*$  is calculated as:

If  $L > 0$ :  $\text{IDX}_{t^*} = \min [\theta, \theta^+] \text{IDX}_t$

If  $L < 0$ :  $\text{IDX}_{t^*} = \max [\theta, \theta^+] \text{IDX}_t$

On that day after the intraday rebalancing  $i$  at time  $t$  the indices are calculated by:



## 21. EURO ISTOXX FUTURES LEVERAGE INDICES

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$$\text{LevIDX}_t = \text{LevIDX}_{t_i^*} \cdot \left[ 1 + L \cdot \left( \frac{\text{IDX}_t}{\text{IDX}_{t_i^*}} - 1 \right) \right]$$

With:

$$\text{LevIDX}_{t_i^*} = \text{LevIDX}_{t-1} \cdot \left[ 1 + L \cdot \left( \frac{\text{IDX}_{t_i^*}}{\text{IDX}_{t-1}} - 1 \right) + (IR + L \cdot c_M \cdot a) \cdot \frac{d}{360} \right]$$

And for  $i > 1$  we simulate a new day by setting  $d = 0$ , thus giving:

$$\text{LevIDX}_{t_i^*} = \text{LevIDX}_{t_{i-1}^*} \cdot \left[ 1 + L \cdot \left( \frac{\text{IDX}_{t_i^*}}{\text{IDX}_{t_{i-1}^*}} - 1 \right) \right]$$

Over the course of the 10 minute period in which the minimum/maximum is determined, the index is not disseminated. The index dissemination ends immediately after the trigger event and is resumed after the 10 minute period has passed. In the case where the intraday rebalancing is triggered after 17:18:45 CET the intraday rebalancing will not be carried out. Any index value that triggers the intraday rebalancing before or equal to 17:18:45 will lead to the intraday rebalancing described above. The regular overnight rebalancing is always carried out, given that the leveraged/short index is not suspended.

### Index Floor

If the leverage/short index reaches a value of 0, the index is set to a value of 0 and its calculation/dissemination is discontinued. The index suspension is announced immediately, and index is terminated after 20 trading days of suspension. When historically back-casting the indices, prior to rebasing, if the indices hit the floor of 0.010 they were reset to an index level of 1000 on that calculation date

## 22. iSTOXX GLOBAL HEALTHCARE ESG EXCLUSIONS SELECT 30 NR RISK CONTROL 10% INDEX

### 22.1. iSTOXX GLOBAL HEALTHCARE ESG EXCLUSIONS SELECT 30 NR RISK CONTROL 10% INDEX

#### 22.1.1. OVERVIEW

The iSTOXX Global Healthcare ESG Exclusions Select 30 NR Risk Control 10% Index replicates the performance of a risk control overlay applied to the iSTOXX Global Healthcare ESG Exclusions Select 30 Index that targets 10% volatility.

**Index types and currencies:** Excess return in EUR

**Base values and dates:** 100 on March 25, 2015.

**Dissemination calendar:** STOXX Europe Calendar

#### 22.1.2. INDEX REVIEW

The Index Level is determined by:

$$IV_t = IV_{t-1} \cdot \left[ 1 + w_{t-1} \left( \frac{UL_t}{UL_{t-1}} - 1 \right) - w_{t-1} \left( IR_{t-1} \frac{ACT(t-1, t)}{360} \right) \right]$$

Where:

$IV_t$  = Excess Return Index level on index level determination date  $t$

$IV_{t-1}$  = Excess Return Index level on index level determination date  $t-1$  (unrounded value used)

$w_{t-1}$  = Weight allocation to underlying index effective on day  $t-1$

$UL_t$  = Index value of underlying index on day  $t$

$UL_{t-1}$  = Index value of underlying index on day  $t-1$

$IR_{t-1}$  = €STR rate on index level determination date  $t-1$ <sup>9</sup>

$Act(t-1, t)$  = Number of calendar days between calculation day  $t-1$  and calculation day  $t$

The index is to be reported and disseminated rounded to 2 decimal places.

#### 22.1.3. DETERMINATION OF THE TARGET WEIGHT

On any Index Level Dissemination Date  $t$ , the Target Weight shall be determined as follows:

$$Tgtw_t = \frac{TgtVol}{MaxRealizedVol_{t(21,63)}}$$

<sup>9</sup> The index will be calculated using €STR that is published on day  $T$  in respect of day  $T-1$ , meaning  $€STR_{t-2}$  is used in the above formula.

## 22. ISTOXX GLOBAL HEALTHCARE ESG EXCLUSIONS SELECT 30 NR RISK CONTROL 10% INDEX

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Where  $MaxRealizedVol_{t,(21,63)}$  is the maximum of realized volatilities measured over 21 and 63 days.

$$RealizedVol_{t,n} = \sqrt{\frac{252}{(n-5) \times 5} \cdot \sum_{i=0}^{n-5-1} \left[ \ln \left( \frac{UL_{t-i}}{UL_{t-i-5}} \right) \right]^2}$$

With  $n = 21, 63$ .

### 22.1.4. DETERMINATION OF THE EQUITY WEIGHT AND INDEX REBALANCING DAYS

The index is rebalanced daily, and the Equity Weight is calculated as follows:

$$w_t = \text{Min}(\text{Cap}, \text{Tgtw}_{t-2})$$

Where: Cap = 150%

## 23. iSTOXX GLOBAL CLEAN ENERGY SELECTED 30 NR RISK CONTROL 10% INDEX

### 23.1. iSTOXX GLOBAL CLEAN ENERGY SELECTED 30 NR RISK CONTROL 10% INDEX

#### 23.1.1. OVERVIEW

The iSTOXX Global Clean Energy Selected 30 NR Risk Control 10% Index replicates the performance of a risk control overlay applied to the iSTOXX Global Clean Energy Selected 30 NR Index that targets 10% volatility.

**Index types and currencies:** Excess return in EUR

**Base values and dates:** 1000 on March 25, 2015

**Dissemination calendar:** STOXX Europe Calendar

#### 23.1.2. INDEX REVIEW

The Index Level is determined by:

$$IV_t = IV_{t-1} \cdot \left[ 1 + w_{t-1} \left( \frac{UL_t}{UL_{t-1}} - 1 \right) - w_{t-1} \left( IR_{t-1} \frac{ACT(t-1, t)}{360} \right) \right]$$

Where:

$IV_t$  = Excess Return Index level on index level determination date  $t$

$IV_{t-1}$  = Excess Return Index level on index level determination date  $t-1$  (unrounded value used)

$w_{t-1}$  = Weight allocation to underlying index effective on day  $t-1$

$UL_t$  = Index value of underlying index on day  $t$

$UL_{t-1}$  = Index value of underlying index on day  $t-1$

$IR_{t-1}$  = €STR rate on index level determination date  $t-1$ <sup>10</sup>

$Act(t-1, t)$  = Number of calendar days between calculation day  $t-1$  and calculation day  $t$

The index is to be reported and disseminated rounded to 2 decimal places.

#### 23.1.3. DETERMINATION OF THE TARGET WEIGHT

On any Index Level Dissemination Date  $t$ , the Target Weight shall be determined as follows:

$$Tgtw_t = \frac{TgtVol}{MaxRealizedVol_{t,(21,63)}}$$

<sup>10</sup> The index will be calculated using €STR that is published on day  $T$  in respect of day  $T-1$ , meaning €STR <sub>$t-2$</sub>  is used in the above formula.

## 23. iSTOXX GLOBAL CLEAN ENERGY SELECTED 30 NR RISK CONTROL 10% INDEX

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Where  $MaxRealizedVol_{t,(21,63)}$  is the maximum of realized volatilities measured over 21 and 63 days.

$$RealizedVol_{t,n} = \sqrt{\frac{252}{(n-5) \times 5} \cdot \sum_{i=0}^{n-5-1} \left[ \ln \left( \frac{UL_{t-i}}{UL_{t-i-5}} \right) \right]^2}$$

With  $n = 21, 63$ .

### 23.1.4. DETERMINATION OF THE EQUITY WEIGHT AND INDEX REBALANCING DAYS

The index is rebalanced daily and the Equity Weight is calculated as follows:

$$w_t = \text{Min}(\text{Cap}, Tgtw_{t-2})$$

Where: Cap = 150%

## 24. iSTOXX VOLATILITY FUTURES INDICES

### 24.1. EURO iSTOXX 50 VOLATILITY SHORT-TERM FUTURES INDEX

#### 24.1.1. OVERVIEW

The EURO iSTOXX 50 Volatility Short-Term Futures Index replicates the performance of a long position in constant-maturity one-month forward, one-month implied volatilities on the underlying EURO STOXX 50 Index.

The indices constantly roll over each month on a daily basis: the EURO iSTOXX 50 Volatility Short-Term Futures Index from the first month of the Eurex VSTOXX Futures contract to the second month.

The EURO iSTOXX 50 Volatility Short-Term Futures Index comprises the following:

**EURO iSTOXX 50 Volatility Short-Term Futures Excess Return Index:** EURO iSTOXX 50 Volatility Short-Term Futures Index ER returns are calculated from a long Eurex VSTOXX futures position that is continuously rolled over the period between the first and second month of Eurex VSTOXX Futures contracts.

**EURO iSTOXX 50 Volatility Short-Term Futures Total Return Index:** EURO iSTOXX 50 Volatility Short-Term Futures Index TR returns are calculated from a long Eurex VSTOXX futures position that is continuously rolled over the period between the first and second month of Eurex VSTOXX futures contracts. The VSTOXX Short-Term Futures Index TR also incorporates interest accrual on the notional value and reinvestment into the index.

**Index Rounding:** 2 d.p.

**Dissemination Time:** 02:10:00 - 22:00:00 CET

**Dissemination Calendar:** STOXX Eurex calendar

**Basic Data:**

| Index Name   | Index Type    | Currency | Base Value | Base Date  | Symbol |
|--|---------------|----------|------------|------------|--------|
| EURO iSTOXX 50 Volatility Short-Term Futures Index | Excess Return | EUR      | 100000     | 30/12/2016 | ISTIME |
| EURO iSTOXX 50 Volatility Short-Term Futures Index | Total Return  | EUR      | 100000     | 30/12/2016 | IST1MT |

#### 24.1.2. INDEX FORMULAS

**Excess Return Calculation**

$$\text{IndexER}_t = \text{IndexER}_{t-1} \cdot \frac{\sum_{i=1}^2 w_{i,t-1} \cdot F_{i,t}}{\sum_{i=1}^2 w_{i,t-1} \cdot F_{i,t-1}}$$

Where:

IndexER<sub>t</sub> = EURO iSTOXX 50 Volatility Short-Term Futures Excess Return Index value on Index business day t

## 24. iSTOXX VOLATILITY FUTURES INDICES

|                    |   |
|--------------------|---|
| T                  | = Index business day on which the Index is computed                 |
| $W_{i,t}$          | = Weight of the $i$ th Futures contract on Index business day $t$   |
| $F_{i,t}$          | = Middle price of $i$ th Futures contract on Index business day $t$ |
| Index Business Day | = A Eurex VSTOXX Futures business day                               |

### Total Return Calculation

$$\text{IndexTR}_t = \text{IndexTR}_{t-1} \cdot \left[ \frac{\sum_{i=1}^2 w_{i,t-1} \cdot F_{i,t}}{\sum_{i=1}^2 w_{i,t-1} \cdot F_{i,t-1}} + \frac{d}{360} \cdot \text{€STR}_{t-1} \right]$$

Where:

|               |   |
|---------------|---|
| IndexTR $_t$  | = EURO iSTOXX 50 Volatility Short-Term Futures Total Return Index value on Index business day $t$ |
| $d$           | = Number of calendar days between Index business day $t$ and preceding Index business day $t-1$   |
| €STR $_{t-1}$ | = The EURO Short-Term rate.   |

### 24.1.3. ROLLING

The EURO iSTOXX 50 Volatility Short-Term Futures Index rolls futures positions on a daily basis. The roll period starts from and includes the monthly EUREX VSTOXX futures settlement date and runs up to, but excludes, the subsequent monthly EUREX VSTOXX futures settlement date.

Rolling between the first month future (F1) and the second month future (F2) takes place over  $n$  index business days. The weights allocated to each F1 and F2 on any given index business day  $t$  are determined as follows:

$$w_{1,t} = 100 \cdot \frac{p_t}{n}$$

$$w_{2,t} = 100 \cdot \frac{n-p_t}{n}$$

Where:

|             |  |
|-------------|--|
| Roll period | = The period from, and including, the most recent EUREX VSTOXX futures settlement date up to, but excluding, the subsequent EUREX VSTOXX futures settlement date   |
| $n$         | = The total number of index business days in the current roll period   |
| $p_t$       | = The number of index business days remaining in the current roll period, starting with the following index business date up to and including the last index business day in the current roll period (Note: on the last index business date of the period, $p_t = 0$ ) |

At the close of the last index business day of any roll period (the index business day immediately preceding a Eurex VSTOXX futures settlement date) all of the weight is allocated to the second month Eurex VSTOXX futures contract. On the Eurex VSTOXX futures settlement date, the second month contract position becomes the first month contract at settlement. On the Eurex VSTOXX futures settlement date and on each subsequent index business day of the new roll period, a fraction of the first month contract is sold and an equal notional amount of the second month Eurex VSTOXX futures contract is bought. This way the allocation to the first month contract is progressively rolled into the following month's contract over the roll period.

## 24. iSTOXX VOLATILITY FUTURES INDICES

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### 24.1.4. CONSEQUENCES OF AN INDEX DISRUPTION EVENT

If an index disruption event in relation to the EUREX futures contract occurs on index dissemination days, then the following applies:

STOXX Ltd. will calculate the value of the index based on the most recent middle futures prices published by EUREX and the roll for that day will be carried to the next index business day, as described in the roll period section.

If an exchange fails to open due to unforeseen circumstances, STOXX Ltd. may determine not to publish the index for that day.

In situations where an exchange introduces a holiday during the month of the index calculation, the index will not be published and the roll for that day will be carried to the next index business day, as described in the roll period section.



## 25. iSTOXX SHORT-TERM FUTURES INVESTABLE INDEX

### 25.1. EURO iSTOXX 50 VOLATILITY SHORT-TERM FUTURES INVESTABLE INDEX

#### 25.1.1. OVERVIEW

The EURO iSTOXX 50 Volatility Short-Term Futures Investable Index replicates the performance of a long position in constant-maturity one-month forward, one-month implied volatilities on the underlying EURO STOXX 50 Index taking into account the bid-ask spread in the roll procedure. The index continuously rolls over on a daily basis from the first month VSTOXX Futures contract to the second month contract.

**Index Rounding:** 2 d.p.

**Dissemination Calendar:** STOXX Eurex Calendar

**Basic Data:**

| Index Name  | Index Type    | Currency | Base Value | Base Date  | Symbol  |
|---|---------------|----------|------------|------------|---------|
| EURO iSTOXX 50 Volatility Short-Term Futures Investable Index | Excess Return | EUR      | 10000      | 30/12/2016 | IST1MSE |
| EURO iSTOXX 50 Volatility Short-Term Futures Investable Index | Excess Return | USD      | 10000      | 30/12/2016 | IST1MSL |

#### 25.1.2. INDEX FORMULAS

The daily index level is defined as

$$IV_t = C_{1t}^{Post} P_{1t}^M + C_{2t}^{Post} P_{2t}^M$$

where

$C_{xt}^{Post}$  = number of contracts of future x held at the end of day t after the roll<sup>11</sup>  
 $P_{xt}^M$  = mid-price of future x on day t based on last bid and ask at 22:00:00 CET

#### 25.1.3. ROLLING PROCEDURE

The roll period starts from and includes the monthly Eurex VSTOXX futures settlement date and runs up to, but excludes, the subsequent monthly Eurex VSTOXX futures settlement date.

<sup>11</sup> On final settlement days the first and second futures refer to the contracts with one month and two months to expiration respectively.

## 25. ISTOXX SHORT-TERM FUTURES INVESTABLE INDEX

The daily roll has to satisfy both the target allocation constraint and the self-financing constraint, as explained below.

### Target allocation constraint (I)

$$w_{1t} = \frac{C_{1t}^{\text{Post}}}{C_{1t}^{\text{Post}} + C_{2t}^{\text{Post}}}$$

After the roll, the number of contracts of each future has to satisfy the target weights with  $w_{1t} + w_{2t} = 1$ .

The target weight after the roll on day  $t$  of contract 1,  $w_{1t}$ , is defined as  $\frac{d}{T}$  where

- $d$  = Number of Index business days between  $t$  and the next settlement date excluding day  $t$  and excluding the next settlement date
- $T$  = the Total Number of Index business days in the current roll period including the previous final settlement date and excluding the next

The futures' final settlement dates are as defined by Eurex<sup>12</sup>:

Final settlement day is 30 calendar days prior to the expiration day of the underlying options (i.e., 30 days prior to the third Friday of the expiration month of the underlying options, if this is an exchange day). This is usually the Wednesday prior to the second last Friday of the respective maturity month, if this is an exchange day; otherwise, the exchange day immediately preceding that day.

### Self-financing constraint (II)

$$C_{1t}^{\text{Post}} P_{1t}^{\text{M}} + C_{2t}^{\text{Post}} P_{2t}^{\text{M}} = C_{1t}^{\text{Pre}} P_{1t}^{\text{M}} + C_{2t}^{\text{Pre}} P_{2t}^{\text{M}} - (C_{1t}^{\text{Post}} - C_{1t}^{\text{Pre}})(P_{1t}^{\text{B}} - P_{1t}^{\text{M}}) - (C_{2t}^{\text{Post}} - C_{2t}^{\text{Pre}})(P_{2t}^{\text{A}} - P_{2t}^{\text{M}})$$

The post-roll index level has to be equal to the pre-roll index level minus the cost of trading (selling contract 1 at bid and buying contract 2 at ask).

- $C_{xt}^{\text{Pre}}$  = number of contracts of future  $x$  held at the end of day  $t$  before the roll; equivalent to number of contracts of the same futures contract held on day  $t-1$  post roll
- $P_{xt}^{\text{B}}$  = bid price, last available at 22:00:00 CET
- $P_{xt}^{\text{A}}$  = ask price, last available at 22:00:00 CET

### Determination of the Number of Contracts

The target allocation (I) and self-financing (II) constraint equations can be solved for the post-roll number of contracts:

$$C_{1t}^{\text{Post}} = \frac{C_{1t}^{\text{Pre}} P_{1t}^{\text{B}} + C_{2t}^{\text{Pre}} P_{2t}^{\text{A}}}{P_{1t}^{\text{B}} + \frac{1 - w_{1t}}{w_{1t}} P_{2t}^{\text{A}}}$$

<sup>12</sup> See <http://www.eurexchange.com/exchange-en/products/vol/vstox/vstox--futures-and-options/VSTOXX--Futures/14566>, subject to any change by Eurex

## 25. ISTOXX SHORT-TERM FUTURES INVESTABLE INDEX

$$C_{2t}^{\text{Post}} = \frac{C_{1t}^{\text{Pre}} P_{1t}^B + C_{2t}^{\text{Pre}} P_{2t}^A}{\frac{w_{1t}}{1-w_{1t}} P_{1t}^B + P_{2t}^A}$$

At the close of the last index business day of any roll period (the index business day immediately preceding a Eurex VSTOXX futures settlement date) all of the weight is allocated to the second month Eurex VSTOXX futures contract:

$$C_{1t}^{\text{Post}} = 0$$

$$C_{2t}^{\text{Post}} = \frac{C_{1t}^{\text{Pre}} P_{1t}^B + C_{2t}^{\text{Pre}} P_{2t}^A}{P_{2t}^A}$$

On the Eurex VSTOXX futures settlement date, the second month contract position becomes the first month contract at settlement. On the settlement date the post-roll number of contracts is calculated by:

$$C_{1t}^{\text{Post}} = \frac{C_{1t}^{\text{Pre}} P_{1t}^B}{P_{1t}^B + \frac{1-w_{1t}}{w_{1t}} P_{2t}^A}$$

$$C_{2t}^{\text{Post}} = \frac{C_{1t}^{\text{Pre}} P_{1t}^B}{\frac{w_{1t}}{1-w_{1t}} P_{1t}^B + P_{2t}^A}$$

On the final settlement date,  $C_{1t}^{\text{Pre}}$  refers to the Eurex VSTOXX future which at the end of the settlement date is the contract with one-month to expiration which on the the prior day had been the second month contract,  $C_2$ .

### 25.1.4. CONSEQUENCES OF AN INDEX DISRUPTION EVENT

If an index disruption event in relation to the EUREX futures contract occurs on index dissemination days, then the following applies:

STOXX Ltd. will calculate the value of the index based on the most recent middle futures prices published by EUREX and the roll for that day will be carried to the next index business day, as described in the roll period section.

If an exchange fails to open due to unforeseen circumstances, STOXX Ltd. may determine not to publish the index for that day.

In situations where an exchange introduces a holiday during the month of the index calculation, the index will not be published and the roll for that day will be carried to the next index business day, as described in the roll period section.

## 25. ISTOXX SHORT-TERM FUTURES INVESTABLE INDEX

### 25.2. EURO iSTOXX 50 VOLATILITY SHORT-TERM FUTURES INVESTABLE 0.5X DAILY SHORT INDEX

#### 25.2.1. OVERVIEW

The EURO iSTOXX 50 Volatility Short-Term Futures Investable 0.5x Daily Short Index replicates a leveraged investment strategy based on the EURO iSTOXX 50 Volatility Short-Term Futures Investable Index.

Short indices are linked inversely to the changes in the underlying index, applying a negative leverage factor to movements in the underlying index. As a result, investing in the EURO iSTOXX 50 Volatility Short-Term Futures Investable 0.5x Daily Short Index yields the reverse performance of the EURO iSTOXX 50 Volatility Short-Term Futures Investable Index, compared to the closing level from the last rebalancing.

**Index Rounding:** 3 d.p.

**Index types and currencies:** Excess Return in USD and EUR

**Base values and dates:** 1000 on December 30, 2016

**Dissemination Calendar:** STOXX Eurex Calendar

#### 25.2.2. INDEX FORMULAS

The index is calculated as follows:

$$IV_t = IV_{t-1} \times \left[ 1 + L \times \left( \frac{U_t}{U_{t-1}} - 1 \right) \right]$$

Where:

$IV_t$  = Index level at time  $t$ .

$U_t$  = Underlying index level at time  $t$ .

$L$  = Leverage factor (-0.5).

$t - 1$  = Previous index rebalancing prior to  $t$  (usually previous calculation day).

#### Adjustments Due To Extreme Market Movements

The rebalancing is based on the calculation of average index values over a time window of 10 minutes. The time window to calculate the average starts 5 minutes after and ends 15 minutes after the trigger event occurs. The rebalancing is triggered when the underlying index appreciates by more than  $x\%$  compared to its previous day's close. The breach of the trigger is checked on a tick-by-tick basis. During this time window, the average of both the underlying index ( $U$ ) and the Short index ( $IV$ ) are calculated. The two averages then substitute respectively  $U_{t-1}$  and  $IV_{t-1}$  in the index calculation formula. The respective trigger values ( $x$ ) are as below:

## 25. ISTOXX SHORT-TERM FUTURES INVESTABLE INDEX

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| Index  | Trigger Value |
|--|---------------|
| EURO iSTOXX 50 Volatility Short-Term Futures Investable 0.5x Daily Short Index | x = 75%       |

Over the course of the 10-minute period in which the average is determined, the index is not disseminated. The index dissemination ends 5 minutes after the trigger event and is resumed with an index level equal to the determined average 15 minutes after the trigger event. Should the intraday rebalancing be triggered less than 15 minutes prior to the end of the index calculation day, the regular overnight rebalancing is carried out. If the strategy index reaches a value of 0 or below over the course of the 15, the index is set to a value of 0 and its calculation / dissemination is discontinued.

### Reverse Split

If the closing value of a daily short index drops below 1 index point, a reverse split is carried out. The affected leverage or short index is multiplied with a factor of 1000. The reverse split is carried out based on the index close ten trading days after the index initially dropped below a closing value of 1 point, notwithstanding whether the index rises above a level of 1 point in the meantime.

### Trading Suspension

If there is suspension of the underlying index, the indices will be calculated with the latest prices available.

## 26. EURO iSTOXX 50 12:55-13:00 TWAP INDEX

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### 26.1. EURO iSTOXX 50 12:55-13:00 TWAP INDEX

#### 26.1.1. OVERVIEW

The EURO iSTOXX 50 12:55-13:00 TWAP Index measures the Time-Weighted Average Price (TWAP) of the EURO STOXX 50 (SX5E) in 15-second intervals between 12:55:00 (included) and 13:00:00 (excluded).

**Underlying Index:** EURO STOXX 50 (SX5E)

**Base values and dates:** 4506.39 on January 02, 2024

**Index types and currencies:** Price return in EUR

**Dissemination calendar:** STOXX Europe calendar

#### 26.1.2. INDEX FORMULA

Index values are calculated using the formula:

$$IV_t = \frac{\sum_{i=1}^N P_i}{N}$$

Where:

$IV_t$  Index value on day  $t$  (rounded to 2 dp)

$P_i$  Price of the EURO STOXX 50 (SX5E) at the  $i^{\text{th}}$  15-second interval.

$N$  The total number of 15-second intervals within the time period (in this case, 20 intervals from 12:55:00 to 12:59:45)

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## 27.1. EURO iSTOXX 50 COLLAR INDEX

### 27.1.1. OVERVIEW

The EURO iSTOXX 50 Collar index aims to replicate a hedging strategy on the EURO STOXX 50 using an Option Collar. The strategy consists in purchasing daily a fraction of 2 Quarterly Put Options, with expiry in the next 12 months and next expiry date afterwards, and selling daily a fraction of 2 to 6 Monthly Call Options, with expiry in the next 1 and 2 months, while holding a long position in the underlying Euro Stoxx 50 index.

Each Option remains in the Option Portfolio till its expiry. The quantity of Options to be daily bought and sold is balanced in order to be in average long 1 Put and short 1 Call. All Options are out-of-the-money, with the strike level for Put Options set to 90% of the Euro Stoxx 50 level. The Call Options position is split between options with strike 102.5% and 104.5% of the Euro Stoxx 50 level.

This Option Collar aims to implement a defensive strategy to smooth down the Euro Stoxx 50 and reduce the volatility. It aims to provide a long-term downside protection, thanks to the long position on Put Options, by forgoing large gains, due to the short position on Call Options.

**Index types and currencies:** Price EUR

**Base values and dates:** 100 on 04.01.2016

**Initial Option Entry Date:** 02.01.2015

**Index dissemination calendar:** STOXX Eurex calendar

### 27.1.2. INPUT DATA

During the calculation of the EURO iSTOXX 50 Collar Index, the following end of day data is used via snapshots:

| Code | Description   |
|------|---|
| SX5E | Euro Stoxx 50 EUR Price index                       |
| SX5T | Euro Stoxx 50 EUR Net Return index                  |
| OESX | Settlement price of quarterly EURO STOXX 50 options |

### 27.1.3. PORTFOLIO DEFINITION

On each index dissemination day, a minimum of four and a maximum of 8 options are identified: 2 put options and between one and six call options:

- The first put option matures in one year time from the Entry Date, the second put option on the first quarterly expiry thereafter
- Call options mature in one and two months from the Entry Date. For each maturity, one to three options are chosen, depending on their strikes. Since the targeted percent call option

## 27. EURO iSTOXX 50 COLLAR INDEX

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strikes can be close to each other from one day to the other, the amount of an option may be increased to reflect the additional amount required for that day.

The Notional Option Table in section 0. describes the logic according to which the options are picked.

Out of these options, if one or more are not part of the portfolio, then they're added to it with their respective Option Quantity value. If one or more options are already part of the portfolio, then the Option Quantity for those options is incremented in order to fulfil the daily strategy requirement. This can happen if the EURO STOXX 50 value fluctuates around the same range of values in a short period of time.

The Options which are going to compose the portfolio are chosen based on the definitions given in the Notional Option Table in section 0:

- Quarterly put options and monthly call options, with 1 to 3 call options for every put option;
- The put option can be Shorter Dated or Longer dated;
- The call options can be 1-month or 2-month dated;
- For each Option Type and Option Expiry Date, the option whose strike is closest to the Reference Option Strike is selected (no preferred side). If two listed option strikes are equally close to the Reference Option Strike, then the strike which is closer to the close value of the EURO STOXX 50 on that index dissemination day will be selected. There is no constraint on the Option Strike to be selected, as long as it is the closest to the Reference Option Strike.

All Options will remain part of the portfolio until Expiry or they are delisted.

For example, on October 2017, the 4th nearby quarterly options expiry date would be September 2018 (1st on Dec 2017, 2nd on Mar 2018, 3rd on Jun 2018).

Let's define:

- **Entry Date:** Each index dissemination day from the Initial Option Entry Date on which there is at least one Option entering the portfolio.

Three baskets of options are created:

- $Entry_t$  is the Entry Universe with respect to the index dissemination day  $t$ : all options for which the Entry Date is on day  $t$ .
- $Expiry_t$  is the Expiry Universe with respect to the index dissemination day  $t$ : all options for which the Expiry Date is on  $t$ .
- $Hold_t$  is the Hold Universe with respect to the index dissemination day  $t$ : all options for which both the following are valid:
  - The Entry Date is strictly before  $t$ ,
  - The Exit Date is strictly after  $t$



## 27. EURO iSTOXX 50 COLLAR INDEX

### 27.1.4. CALCULATIONS

#### 27.1.4.1. OPTION QUANTITY

The first step in the index calculation is to calculate for every option entering the portfolio the corresponding Option Quantity.

The Option Quantity represents the fraction of option which is part of the portfolio on any given day. It is a value defined at Entry Day, i.e. when the option first enters the portfolio. The Option Quantity for a specific option can be incremented on a daily basis, depending on whether that option is eligible to enter the portfolio on that day again. The value is calculated by rescaling the Option Position by the number of days in the time period of the option life. In this context, the factor  $RIDD_{i,t}/NIDD_i$  represents the percentage of the index dissemination days remaining before the end of the current period (i.e. end of the quarter or end of the month), rescaled then by  $OD_i * NIDD_i$  which counts the remaining number of days before the option expiry. The Option Quantity is thus defined as:

$$q_i = \begin{cases} OP_i * \frac{RIDD_i}{NIDD_i} * \frac{1}{OD_i * NIDD_i} & \text{for Shorter Dated options} \\ OP_i * \left(1 - \frac{RIDD_i}{NIDD_i}\right) * \frac{1}{OD_i * NIDD_i} & \text{for Longer Dated options} \\ OP_i * \frac{1}{OD_i * NIDD_i} & \text{for 1-month and 2-months options} \end{cases}$$

Where, according to the Notional Option Table in section 0:

- $OP_i$  is the Option Position for option i.
- $OD_i$  is the Option Divisor for option i.
- $RIDD_i$  is the Remaining Number of Index Dissemination Days till next expiry excluded:

$$RIDD_i = [T_i^{\text{Entry}}, T_i^{\text{Expiry}})$$

- $NIDD_i$  is the Number of Index Dissemination Days:

$$NIDD_i = [T_i^{\text{PrevExpiry}}, T_i^{\text{Expiry}})$$

Where:

- $T_i^{\text{Expiry}} =$ 
  - {Immediately following 3rd Friday, for Monthly Options
  - {Immediately following 3rd Friday of March, June, Sep, Dec, for Quarterly Options
strictly after the current index dissemination day
- $T_i^{\text{PrevExpiry}}$  is the immediately preceding expiry before or on the current index dissemination day

#### 27.1.4.2. OPTION ENTRY VALUE

The value of each option entering the portfolio is calculated as the settlement value of the option adjusted by transaction costs. The Entry Value of call options should be lower than the option value, since they are sold, hence transaction costs should be negative. On the other hand, the Entry Value

## 27. EURO iSTOXX 50 COLLAR INDEX

for put options should be higher than the option value, since they are bought, hence the transaction costs should be positive.

The transaction costs for all options are capped to 30% of the option premium. In order to avoid selling call options at a negative premium, the Option Entry value has a floor of 0.1 EUR, which is the minimum price tick as per Eurex contract specification.

The Entry value in formula is thus defined as:

$$O_i^{\text{Entry}} = \begin{cases} O_{i,T_i^{\text{Entry}}} + \min(OTCR_i * S_{\text{Entry}}, 30\% * O_{i,T_i^{\text{Entry}}}) & \text{if } i \text{ is a Put Option} \\ \max[\text{Tick Size}, O_{i,T_i^{\text{Entry}}} - \min(OTCR_i * S_{\text{Entry}}, 30\% * O_{i,T_i^{\text{Entry}}})] & \text{if } i \text{ is a Call Option} \end{cases}$$

where

- $OTCR_i$  is the Option Transaction Cost for Option  $i$  (as defined in section 0).
- $S_{\text{Entry}}$  is the Euro Stoxx 50 close value at Entry Date.
- $T_i^{\text{Entry}}$  is the Option Entry Date.
- Tick Size is 0.10 EUR, the minimum tick size as specified by Eurex

### 27.1.4.3. OPTION PORTFOLIO LEVEL

The Option Portfolio Level is the current value of the Option portfolio and is defined as:

$$OPL_t = OPL_t^{\text{MTM}} + OPL_t^{\text{DAILY\_VARIATION}}$$

Having:

- $OPL_t^{\text{MTM}}$  the Mark-to-market value of the portfolio, calculated on each day  $t$  by multiplying the Option Quantity by the option settlement on such day:

$$OPL_t^{\text{MTM}} = \sum_{i \in \text{Entry}_t \cup \text{Hold}_t} q_i * O_{i,t}$$

- $OPL_t^{\text{DAILY\_VARIATION}}$  is the daily variation in the option value and is calculated on each day  $t$  by considering all options entering the portfolio and all options expiring on such day, in a way similar to the Mark-to-market calculation. To be noted that by multiplying  $q_i * (-O_i^{\text{Entry}})$  the option transaction cost results always positive.

$$OPL_t^{\text{DAILY\_VARIATION}} = \begin{cases} \sum_{i \in \text{Entry}_0} q_i * (-O_i^{\text{Entry}}) & t = 0 \\ OPL_{t-1}^{\text{DAILY\_VARIATION}} + \sum_{i \in \text{Entry}_t} q_i * (-O_i^{\text{Entry}}) + \sum_{i \in \text{Expiry}_t} q_i * (+O_i^{\text{Expiry}}) & t > 0 \end{cases}$$

Where:

- $t = 0$  is the index base date, as defined in section 0
- $q_i$  is the Option quantity for option  $i$ .
- $O_{i,t}$  is the value of the option  $i$  at time  $t$ . With respect to an option and an index dissemination day before its Expiry Date, it is the Option Settlement Value. With respect to an option on or after its Expiry Date, the Option Value is equal to the Option Expiry Value.

## 27. EURO iSTOXX 50 COLLAR INDEX

- $O_i^{Expiry}$  is the Expiry value for Option i, defined as the Options Settlement Value on Expiry Date

### 27.1.4.4. INDEX VALUE CALCULATION

The daily return of the index is calculated as the daily return of the underlying Euro Stoxx 50, plus the dividend yield, plus the daily variation in the value of the option portfolio

In formula:

$$I_t = \begin{cases} 100 & t = 0 \\ I_{t-1} * \left( \frac{S_t + \Delta OPL_t}{S_{t-1}} + Div_t \right) & t > 0 \end{cases}$$

Where:

- $t = 0$  is the index base date, as defined in section 0
- $S_t$  is the closing index value of Euro Stoxx 50 EUR Price index (symbol SX5E) at time t
- $Div_t$  represents the net dividend yield earned on day t and is calculated as:

$$Div_t = \frac{SX5T_t}{SX5T_{t-1}} - \frac{SX5E_t}{SX5E_{t-1}}$$

where  $SX5T_t$  is the closing index value of Euro Stoxx 50 EUR Net Return index.

- $\Delta OPL_t$  is the variation in the Option Portfolio Level on day t minus the cost of borrowing the money to implement the Option strategy on such day. In fact, the entire cash position available in the portfolio on day t-1 is invested to purchase the stock basket corresponding to the Euro Stoxx 50, which would provide a return of  $I_{t-1} * \left( \frac{S_t}{S_{t-1}} + Div_t \right)$ . In order to implement the Option strategy on that day and get exposure to the variation in the Option Portfolio Level, we need to borrow the cash amount corresponding to the current value of the Option Portfolio, which is equal to  $OPL_{t-1}^{MTM}$  times the de-annualized risk-free rate used for borrowing.

In formula:

$$\Delta OPL_t = OPL_t - OPL_{t-1} - OPL_{t-1}^{MTM} * \frac{SGCPON_{t-1}}{100} * \frac{Act(t-1, t)}{360}$$

Where

- $SGCPON_t$  is the STOXX GC Pooling EUR ON index value on day t as risk-free rate.
- $Act(t-1, t)$  is the number of calendar days from but excluding date t-1 to and including date t.

### 27.1.5. TRANSACTION COSTS

Transaction costs depend on the implied volatility level as measured by the VSTOXX 30 day index:

## 27. EURO iSTOXX 50 COLLAR INDEX

| Cost (bps)                            | Call Leg |      |       |       |      |       | Put Leg |
|---------------------------------------|----------|------|-------|-------|------|-------|---------|
|                                       | 1m       |      |       | 2m    |      |       | 12m     |
| Expiry                                |          |      |       |       |      |       |         |
| Strike (as percent of the SX5E level) | 102.5    | 103  | 103.5 | 103.5 | 104  | 104.5 | 90      |
| VSTOXX < 12.5                         | 3.5      | 3    | 2.5   | 5.5   | 5    | 4     | 15      |
| 12.5 ≤ VSTOXX < 20                    | 6.5      | 6    | 5.5   | 9.5   | 9    | 8     | 22.5    |
| 20 ≤ VSTOXX < 30                      | 9        | 9    | 8.5   | 13    | 12.5 | 12    | 32.5    |
| VSTOXX ≥ 30                           | 13.5     | 13.5 | 13    | 19    | 19   | 18.5  | 47.5    |

### 27.1.6. NOTIONAL OPTION TABLE

The Option Strike Percentage described in the table below are defined with respect to the index closing value on day  $t$  of EURO STOXX 50 Index (SX5E). Options entering the portfolio on any day  $t$  produce returns between day  $t$  and day  $t+1$ , while the corresponding transaction costs are included in the index close of day  $t$ . Since the options on any day  $t$  have to be bought before close, using the close value of EURO STOXX 50 generates a small gap in replicability, which is generally accepted in the market, but makes the strategy more precise in terms of options selection.

| Option Position | Option Type   | Option Strike Percentage | Option Expiry Date  | Option Divisor | Option Expiry Frequency |
|-----------------|---------------|--------------------------|---|----------------|-------------------------|
| 1 (Buy)         | European Put  | 90%                      | Shorter Dated – Options with Expiry Date on March, June, September, December falling on or immediately before the day 12 months after the Entry Date    | 4              | Quarterly               |
| 1 (Buy)         | European Put  | 90%                      | Longer Dated – Options with Expiry Date on March, June, September, December falling immediately after the day 12 months after the Entry Date            | 4              | Quarterly               |
| -1/6 (Sell)     | European Call | 102.5%                   | 1-month – Options with Expiry Date on the 3rd Friday of each month falling strictly after 10 Index Dissemination Days from such Index Dissemination Day | 1              | Monthly                 |

## 27. EURO iSTOXX 50 COLLAR INDEX

|                |                  |        |   |   |         |
|----------------|------------------|--------|---|---|---------|
| -1/6<br>(Sell) | European<br>Call | 103%   | 1-month – Options with<br>Expiry Date on the 3rd<br>Friday of each month falling<br>strictly after 10 Index<br>Dissemination Days from<br>such Index Dissemination<br>Day | 1 | Monthly |
| -1/6<br>(Sell) | European<br>Call | 103.5% | 1-month – Options with<br>Expiry Date on the 3rd<br>Friday of each month falling<br>strictly after 10 Index<br>Dissemination Days from<br>such Index Dissemination<br>Day | 1 | Monthly |
| -1/6<br>(Sell) | European<br>Call | 103.5% | 2-month – Options with<br>Expiry Date on the 3rd<br>Friday of each month falling<br>strictly after the 1-month<br>Expiry Date on such Index<br>Dissemination Day          | 2 | Monthly |
| -1/6<br>(Sell) | European<br>Call | 104%   | 2-month – Options with<br>Expiry Date on the 3rd<br>Friday of each month falling<br>strictly after the 1-month<br>Expiry Date on such Index<br>Dissemination Day          | 2 | Monthly |
| -1/6<br>(Sell) | European<br>Call | 104.5% | 2-month – Options with<br>Expiry Date on the 3rd<br>Friday of each month falling<br>strictly after the 1-month<br>Expiry Date on such Index<br>Dissemination Day          | 2 | Monthly |

### 27.1.7. MARKET DISRUPTION EVENTS

STOXX will exclude from their indices all options as soon as their delisting becomes known to STOXX (e.g. direct notification from the market, or unavailability of a settlement price)

## 28. iSTOXX PPF RESPONSIBLE SDG MONTHLY HEDGED 50% INDEX

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### 28.1. iSTOXX PPF RESPONSIBLE SDG MONTHLY HEDGED 50% INDEX

#### 28.1.1. OVERVIEW

A currency-hedged index is designed to represent returns for global index investment strategies that involve hedging currency risk, but not the underlying constituent risk. The currency-hedged strategy indices eliminate the risk of currency fluctuations at the cost of potential currency gains.

#### 28.1.2. DEFINITIONS

The iSTOXX PPF Responsible SDG Monthly Hedged 50% Index is available in the following types and currencies: net and gross return, in EUR

**Base values and dates:** 1000 on September 30, 2021

**Dissemination calendar:** STOXX Global calendar

#### 28.1.3. CALCULATIONS

The iSTOXX PPF Responsible SDG Monthly Hedged 50% Index measures the performance of the iSTOXX PPF Responsible SDG Index while at the same time partially eliminating foreign currency fluctuations through hedging. Foreign currency fluctuations are partially eliminated with a monthly 50% currency hedge where the reset of the hedge notional occurs on a monthly basis.

The hedge multiplier parameter is set to 0.5 to implement the 50% currency hedge. The full calculation methodology is covered in chapter 19 of the [STOXX Strategy Guide](#).

## 29. iSTOXX LEVERAGED 3X GLOB 0.75% MF DEDUCTED INDEX

### 29.1. iSTOXX LEVERAGED 3X GLOB 0.75% MF DEDUCTED INDEX

#### 29.1.1. OVERVIEW

The iSTOXX Leveraged 3X GLOB 0.75% MF Deducted Index replicates the performance of the iSTOXX Leveraged 3X GLOB Index, while assuming a 0.75% performance deduction per annum. This deduction is performed in order to replicate the management fees associated with replicating the index. The performance deduction accrues constantly on a daily basis (using an Actual/365 fixed day count convention).

The index follows standard STOXX Decrement Index methodology.

**Base Value and Date:** 100000 as of January 2, 2020

**Underlying Index:** iSTOXX Leveraged 3X GLOB Index

**Deducted Amount (in percentage points):** 0.75%

**Index Type and Currency:** Price Return in USD

**Dissemination calendar:** STOXX USA calendar

#### 29.1.2. INDEX FORMULA

Index values are calculated using the formula:

$$IV_t = IV_{t-1} \times \left( \frac{U_t}{U_{t-1}} - D \frac{\text{Act}(t-1, t)}{365} \right)$$

Where:

|                      |  |
|----------------------|--|
| $IV_t$               | The value of the index for calculation date t.   |
| $IV_{t-1}$           | The value of the index for the calculation day immediately preceding calculation day t.                      |
| $U_t$                | The adjusted value of the underlying index for calculation date t (IX3XGLOB).                                |
| $U_{t-1}$            | The adjusted value of the underlying index for the calculation date immediately preceding calculation day t. |
| $\text{Act}(t-1, t)$ | The number of calendar days between calculation days t-1 and t.  |
| D                    | The deducted amount expressed in percentage points (0.75%).  |

#### 29.1.3. ONGOING MAINTENANCE

In the event of a reverse split in the underlying index, the previous days underlying value ( $U_{t-1}$ ) will be reconfigured with the updated adjusted value to ensure consistent calculation.

## 30. EURO iSTOXX 50 NR DECREMENT 120 KRW HEDGED INDEX

### 30.1. EURO iSTOXX 50 NR DECREMENT 120 KRW HEDGED INDEX

#### 30.1.1. OVERVIEW

The EURO iSTOXX 50 NR Decrement 120 KRW Hedged index replicates the returns of the EURO iSTOXX 50 NR Decrement 120 index with a monthly currency hedge where the reset of the hedge notional occurs on a monthly basis. At each rebalancing date, the index will enter into a one-month forward contract to sell USDKRW and buy USDEUR at a predefined exchange rate.

#### 30.1.2. DEFINITIONS

**Base value:** 2642.78

**Base date:** 29 September 2009

**Underlying Index:** EURO iSTOXX 50 NR Decrement 120 index

**Index Type:** Price

**Index Currency:** KRW

**Dissemination calendar:** The intersection of the STOXX Europe calendar and South Korea Stock Exchange trading days

#### 30.1.3. CALCULATIONS

$$H\_IDX_t = H\_IDX_{t_r} \cdot \left[ \frac{UH\_IDX_t}{UH\_IDX_{t_r}} + \frac{H\_IDX_{t_r-1}}{H\_IDX_{t_r}} \cdot HR_{t_r} \cdot \left( \frac{FX_{t_r-1}}{FF_{t_r}} - \frac{FX_{t_r-1}}{IFF_t} \right) \right]$$

Where

|             |   |
|-------------|---|
| $H\_IDX$    | hedged index for day $t$  |
| $UH\_IDX_t$ | unhedged reference index in KRW for day $t$ , equivalent to the underlying index level for day $t$ divided by $FX_t$          |
| $t_r$       | last calculation day of preceding month (reset date)  |
| $t$         | day of index calculation  |
| $T$         | day on the last calculation date of the month   |
| $HR$        | hedge ratio of currency hedge, $HR_{t_r} = 100\%$   |
| $FX_t$      | $1/(EURUSD_t \cdot USDKRW_t)$   |
| $FF_t$      | $1/(EURUSD\_1M\_Fwd_t \cdot USDKRW\_1M\_Fwd_t)$   |
| $IFF_t$     | the interpolated forward rate for day $t$ , expressed as units of EUR per unit of KRW, $FX_t + (1 - t/T) \cdot (FF_t - FX_t)$ |
| $EURUSD_t$  | units of USD per unit EUR, obtained using WM Fixing of 6AM GMT  |
| $USDKRW_t$  | units of KRW per unit USD, obtained using WM Fixing of 6AM GMT  |



## 30. EURO iSTOXX 50 NR DECREMENT 120 KRW HEDGED INDEX

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|                            |  |
|----------------------------|--|
| EURUSD_1M_Fwd <sub>t</sub> | 1-month forward currency rate, expressed as units of USD per unit EUR, obtained using WM Fixing of 6AM GMT     |
| USDKRW_1M_Fwd <sub>t</sub> | 1-month NDF forward currency rate, expressed as units of KRW per unit USD, obtained using WM Fixing of 6AM GMT |

## 31. iSTOXX EQUITY DIVIDEND INDICES

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### 31.1. iSTOXX EQUITY DIVIDEND INDICES

#### 31.1.1. OVERVIEW

The Equity Dividend Indices are designed to track the total net dividend per share amount paid by single equities over the period of time spanning from base date till the current day.

All cash and scrip (with cash alternative) dividend types are taken into account, i.e. regular and special dividends, as reported by the company – and the index value is adjusted for corporate actions over time. If a dividend has gone ex- and is included in the Equity Dividend Indices but subsequently amended or not paid post the ex-date dissemination day, there will not be an adjustment to the Equity Dividend Indices.

**Universe:** The broad universe for the indices is defined by EUR, GBP and CHF denominated stocks in the STOXX Europe 600, with a subset of these being made into EDI's. For a complete list, please consult the data vendor code sheet on the STOXX website.

**Index types and currencies:** Price in GBP, EUR & CHF

**Base values and dates:** Base Value of 0, for Base Dates please consult the data vendor code sheet on the STOXX website.

**Dissemination Calendar:** STOXX Europe Calendar

#### 31.1.2. CALCULATIONS

$$I_t = \begin{cases} 0 & t = 0 \\ \left( I_{t-1} + \sum_{i=1}^n \left( Div_{i,t}^{announced} \cdot FX_{i,t} \cdot K_{i,t} \cdot (1 - WHT_{i,t}) \right) \right) \cdot R_t & t > 0 \end{cases}$$

$$ADJ\_I_t = I_t \cdot \prod_{t' > t} R_{t'}$$

Where:

- $I$  is the unadjusted equity dividend index level
- $ADJ\_I$  is the adjusted equity dividend index level for corporate actions
- $t$  refers to each index dissemination day.
- $n$  is the number of securities in the portfolio – can be more than 1 in case of spin-offs.
- $WHT_{i,t}$  is the withholding tax rate applicable for component  $i$  at time  $t$ , as defined by STOXX <https://www.stoxx.com/withholding-taxes> according to STOXX calculation methodology.
- $Div_{i,t}^{announced}$  is the unadjusted gross declared dividend amount (both ordinary and special) in respect of each share of the company for component  $i$  at time  $t+1$  being an ex-dividend date or zero if no amount is applicable

## 31. iSTOXX EQUITY DIVIDEND INDICES

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- $FX_{i,t}$  is the WM exchange rate on day  $t$ , from the currency on which the dividend for component  $i$  effective on  $t+1$  is paid to the index currency according to STOXX calculation methodology.
- $K_{i,t}$  is the K-factor for component  $i$  on day  $t$ , as defined below in the adjustments section.
- $R_t$  is the R-factor for the mother company on day  $t$ , as defined below in the adjustments section.

The index value is calculated using full decimals precision and disseminated with 4 dps.

### 31.1.3. INDEX FORMULA AND INTERMEDIATE CALCULATION STEPS

The K and R-factors provide adjustments for the corporate actions.

The K-factor determines the ratio for spin-offs, applied as basket methodology. Following points have to be considered:

- in case of a spin-off, a product may have two or more underlyings
- if both the mother company and the daughter company have a dividend payment with the same ex-date, the dividend of the daughter company will be multiplied with the K-factor and added to the dividend of the mother company
- K-factor represents the spin-off ratio and will be allocated to the daughter companies

In case of spin-offs where the spun-off child company is listed on an eligible European exchange per the STOXX Europe Total Market, the child companies are added to the index basket together with the mother company. The K-factor represents the spin-off ratio and it multiplies the dividends of the child components. In case a dividend is paid on the same date by more than one component of the index, then the dividends are calculated as stated above and summed together for the final index value calculation.

The K-factor is calculated on the spin-off effective date and it is constant until the next corporate action event.

$$K_{i,spin-off} = \begin{cases} 1 & \text{if } i \text{ is the mother company} \\ \text{split ratio} & \text{if } i \text{ is a child component} \end{cases}$$

For corporate actions involving the child company after the spin-off effective date, the  $K_i$  will be adjusted by the R-factor of the child company.

$$K_{i,t} = \frac{K_{i,t-1}}{R_{i,t}}$$

Otherwise, the spin-off corporate action is handled as an R-factor adjustment as a stock dividend of another company.

In the case where the child company is delisted or taken over, it will be removed from the index basket.

## 31. iSTOXX EQUITY DIVIDEND INDICES

The R-factor provides for corporate actions linked to capital adjustments and distributions and will be rounded to 8 decimal points. In general, the R-factor calculation is defined as:

$$R_{i,t} = \frac{S_{adj,i,t}}{S_{old,i,t}}$$

Therefore, the R-factor formula for capital adjustments is:

$$R_{i,t} = \frac{N_{old,i,t}}{N_{new,i,t}} \cdot \frac{S_{old,i,t} - E_{i,t}}{S_{old,i,t}} + \frac{E_{i,t}}{S_{old,i,t}}$$

In addition, the R-factor formula for distributions is:

$$R_{i,t} = \frac{S_{old,i,t} - E_{i,t}}{S_{old,i,t}}$$

Where:

- $N_{old,i,t}$  refers to the number of shares prior to the corporate action for component  $i$  effective on day  $t+1$
- $N_{new,i,t}$  refers to the number of shares after the corporate action for component  $i$  effective on day  $t+1$
- $S_{old,i,t}$  refers to the official closing price for component  $i$  on day  $t$ , or in the case where the corporate action effective date is identical to the ex-date of a cash dividend,  $Div_{i,t}^{announced}$ , then it is the official closing price minus the cash dividend amount,  $Div_{i,t}^{announced}$ .
- $S_{adj,i,t}$  refers to the adjusted opening price for component  $i$  on day  $t+1$  after adjusting  $S_{old,i,t}$  for the corporate action effective on day  $t+1$
- $E_{i,t}$  refers to the value of the entitlement for component  $i$  effective on day  $t+1$

The R-factors adjustments for the following corporate actions are described as follows and calculated according to STOXX calculation methodology. In the formulas below, B refers to the number of shares obtained (returned) for A shares held.

1. Stock dividends / Bonus issue; B (additional) for every A

$$R_{i,t} = \frac{N_{old,i,t}}{N_{new,i,t}} = \frac{A}{A+B}$$

2. Stock dividend (from Treasury stock); B (additional) for every A

$$R_{i,t} = \frac{N_{old,i,t}}{N_{new,i,t}} = \frac{A}{A+B}$$

3. Split and reverse split; B (additional) for every A; i.e. for reverse split B negative

$$R_{i,t} = \frac{N_{old,i,t}}{N_{new,i,t}} = \frac{A}{A+B}$$

## 31. iSTOXX EQUITY DIVIDEND INDICES

4. Merger; B (additional) shares in new company for every A old share (similar to No. 3 for surviving company).

If the company is being taken over, the index will stop calculating as the company will be deleted from the STOXX Total Market index and will continue being disseminated with its last calculated value.

5. Stock dividend of another company; B shares of other company for A

$$R_{i,t} = \frac{S_{old,i,t} - E_{i,t}}{S_{old,i,t}} = \frac{S_{old,i,t} - S_{other,t} \frac{B}{A}}{S_{old,i,t}}$$

Where:

$E_{i,t} = S_{other,t} \times$  Number of shares per one share of original company  $i$ , and  
 $S_{other,t}$  is the closing price of the other company on day  $t$ .

6. Return of capital and share consolidation; the return of capital is treated as a special dividend and the share consolidation is treated as a reverse stock split, B (additional) for every A; B often negative

$$R_{i,t} = \frac{N_{old,i,t}}{N_{new,i,t}} = \frac{A}{A + B}$$

Where:

$N_{new,i,t}$  = Number of shares after consolidation for every  $N_{old,i,t}$  shares held

7. Rights issue (capital increase via cash by issue of new shares with full dividend rights); B (additional) shares for every A

$$R_{i,t} = \frac{N_{old,i,t}}{N_{new,i,t}} \cdot \frac{S_{old,i,t} - E_{i,t}}{S_{old,i,t}} + \frac{E_{i,t}}{S_{old,i,t}} = \frac{A}{A + B} \cdot \frac{S_{old,i,t} - E_{i,t}}{S_{old,i,t}} + \frac{E_{i,t}}{S_{old,i,t}}$$

Where:

$N_{new,i,t} = N_{old,i,t} +$  number of new shares for every  $N_{old,i,t}$  shares held

$E_{i,t}$  = subscription price of the new share

In the case of highly dilutive rights issues and extremely dilutive rights issues without sufficient notice period, the R-factor will be calculated as a complex corporate action.

In the case of extremely dilutive rights issues with sufficient notice period, the index will stop calculating as the company will be deleted from the STOXX Total Market index and will continue being disseminated with its last calculated value.

8. Right issues without full dividends rights (capital increase via cash by issue of new shares without full dividend rights); B (additional) shares for every A

$$R_{i,t} = \frac{N_{old,i,t}}{N_{new,i,t}} \cdot \frac{S_{old,i,t} - E_{i,t}}{S_{old,i,t}} + \frac{E_{i,t}}{S_{old,i,t}} = \frac{A}{A + B} \cdot \frac{S_{old,i,t} - E_{i,t}}{S_{old,i,t}} + \frac{E_{i,t}}{S_{old,i,t}}$$

Where:

$N_{new,i,t} = N_{old,i,t} +$  number of new shares for every  $N_{old,i,t}$  shares held

## 31. iSTOXX EQUITY DIVIDEND INDICES

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$E_{i,t}$  = subscription price of the new share + dividend loss (difference between the dividend of the old share and the dividend of the new share)

In the case of highly dilutive rights issues and extremely dilutive rights issues without sufficient notice period, the R-factor will be calculated as a complex corporate action.

In the case of extremely dilutive rights issues with sufficient notice period, the index will stop calculating as the company will be deleted from the STOXX Total Market index and will continue being disseminated with its last calculated value.

9. Other complex corporate actions and combinations of the above will be calculated using on the adjusted price as calculated based on the STOXX Calculation Guide to reflect the stock's corporate action that will be effective the next trading day.

## 32. iSTOXX BANK AUTO AND OIL & GAS EW INDEX

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### 32.1. iSTOXX BANK AUTO AND OIL & GAS EW INDEX

#### 32.1.1. OVERVIEW

The aim of the iSTOXX Bank Auto and Oil & Gas EW Index is to invest an equal, fixed proportion into each of the underlying indices. The strategy takes the average of the daily performance of each basket component into account. For this index the basket will be composed of the Gross Return versions of the EURO STOXX Automobiles & Parts, EURO STOXX Banks and EURO STOXX Oil & Gas Indices.

**Index types and currencies:** Gross Return in EUR

**Base values and dates:** 1000 on Dec 29, 2000

**Dissemination calendar:** STOXX Europe Calendar

#### 32.1.2. INDEX FORMULA

The index is calculated as follows:

$$IV_t = IV_{t-1} \times \left[ w_1 \cdot \frac{U_{1,t}}{U_{1,t-1}} + w_2 \cdot \frac{U_{2,t}}{U_{2,t-1}} + w_3 \cdot \frac{U_{3,t}}{U_{3,t-1}} \right]$$

Where:

- $IV_t$  Index level at time t.
- $U_{n,t}$  Index level of underlying n at time t.
- $w_n$  Weight of underlying n (all set to 1/3).

#### **n Underlying Index**

- 1 EURO STOXX Banks GR Index
- 2 EURO STOXX Automobiles & Parts GR Index
- 3 EURO STOXX Oil & Gas GR Index

## 33. iSTOXX BANK AUTO & BASIC RESOURCES EW INDEX

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### 33.1. iSTOXX BANK AUTO & BASIC RESOURCES EW INDEX

#### 33.1.1. OVERVIEW

The aim of the iSTOXX Bank Auto & Basic Resources EW Index is to invest an equal, fixed proportion into each of the underlying indices. The strategy takes the average of the daily performance of each basket component into account. For this index the basket will be composed of the Gross Return versions of the STOXX Europe 600 Automobiles & Parts, EURO STOXX Banks and STOXX Europe 600 Basic Resources Indices.

**Universe:** Gross Return versions of the STOXX Europe 600 Automobiles & Parts, EURO STOXX Banks and STOXX Europe 600 Basic Resources Indices

**Index types and currencies:** Gross Return in EUR

**Base values and dates:** 100 on Dec 29, 2000

**Dissemination calendar:** STOXX Europe Calendar

#### 33.1.2. INDEX FORMULA

The strategy takes the average of the daily performance of each basket component, with the index level being calculated as follows:

$$IV_t = IV_{t-1} * \left( \frac{U1_t}{U1_{t-1}} * W1 + \frac{U2_t}{U2_{t-1}} * W2 + \frac{U3_t}{U3_{t-1}} * W3 + a \right) + b$$

Where:

$IV_t$  = Index value on day t.

$U_t$  = Underlying Indices value on day t (STOXX Europe 600 Automobiles & Parts GR, EURO STOXX Banks GR and STOXX Europe 600 Basic Resources GR Indices).

$W$  = Weight of each component (all set to 1/3).

Constants a and b = 0.



## 34. iSTOXX GLOBAL ESG SELECT 50 RISK CONTROL 10% RV INDEX

### 34.1. iSTOXX GLOBAL ESG SELECT 50 RISK CONTROL 10% RV INDEX

#### 34.1.1. OVERVIEW

The iSTOXX Global ESG Select 50 Risk Control 10% RV index is designed to control the risk profile of the underlying iSTOXX Global ESG Select 50 Index. The index reflects a 10% target volatility strategy. This strategy involves a shift between a risk-free money market investment and a risky portfolio (iSTOXX Global ESG Select 50). The allocations of the index is determined by the realized volatility of the underlying index.

**Base Values and Dates:** 100 as of 20 July 2004.

**Underlying Index:** iSTOXX Global ESG Select 50 Index.

**Index Rounding:** 2 d.p.

**Dissemination Calendar:** STOXX Europe Calendar.

**Index Types and Currencies:** Total Return in EUR.

#### 34.1.2. INDEX FORMULA

The Index Level is determined by:

$$IV_t = IV_{t-1} \times \left[ 1 + w_{t-1} \left( \frac{UL_t}{UL_{t-1}} - 1 \right) + (1 - w_{t-1}) \left( (IR_{t-1}) \frac{\text{Diff}(t-1,t)}{360} \right) \right]$$

Where:

$IV_t$  = Index level on index level determination date  $t$ .

$IV_{t-1}$  = Index level on index level determination date  $t-1$  (unrounded value used).

$w_{t-1}$  = Weight allocation to underlying index effective on day  $t-1$ .

$UL_t$  = Index value of underlying index on day  $t$ .

$UL_{t-1}$  = Index value of underlying index on day  $t-1$ .

$IR_{t-1}$  = EURIBOR1M rate on index level determination date  $t-1$ .

$\text{Act}(t-1,t)$  = Number of calendar days between calculation day  $t-1$  and calculation day  $t$ .

#### DETERMINATION OF THE TARGET WEIGHT

On any Index Level Determination Date  $t$ , the Target Weight shall be determined as follows:

$$\text{Tgtw}_t = \frac{\text{TgtVol}}{\text{MaxRealizedVol}_{(20,60)}}$$

Where:

$\text{TgtVol}$  = Predetermined level of volatility (10%).

$\text{MaxRealizedVol}_{20,60}$  = The maximum of the realized volatilities measured over 20 and 60 days.

## 34. iSTOXX GLOBAL ESG SELECT 50 RISK CONTROL 10% RV INDEX

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$$\text{Realized Vol}_{t,n} = \sqrt{\frac{252}{n} \cdot \sum_s \left[ \ln \left( \frac{UL_s}{UL_{s-1}} \right) \right]^2}$$

Where:

$n = 19$  (59).

$s$  = Ranging from  $t-18$  to  $t$  ( $t-58$  to  $t$ ).

### DETERMINATION OF THE EQUITY WEIGHT AND INDEX REBALANCING DAYS

The Equity Weight on the Index Start Date shall be equal to the Target Weight at the Index Start Date,

$$w_0 = \text{Min}(\text{Cap}, \text{Tgtw}_0)$$

On any Index Level Determination Date  $t$  subsequent to the Index Start Date, the Equity Weight shall be determined as follows:

$$(i) \text{ If } \left| 1 - \frac{w_{t-1}}{\text{Tgtw}_{t-1}} \right| > \text{Tolerance}$$

Then the Index Level Determination Date  $t$  will be an Index Rebalancing Day and:

$$w_t = \text{Min}(\text{Cap}, \text{Tgtw}_{t-1})$$

(ii) Otherwise, Index Level Determination Date  $t$  will not be an Index Rebalancing Day and:

$$w_t = w_{t-1}$$

Where:

Tolerance = Predefined deviation from the target weight, set to 5%.

$w_t$  = Equity Weight on Index Level Determination Date  $t$ .

$\text{Tgtw}_t$  = Target Weight on Index Level Determination Date  $t$ .

Cap = Maximum portion that can be given to the risky asset, set to 150%.

## 35. CHANGES TO THE GUIDE BOOK

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### 35.1. HISTORY OF CHANGES TO THE iSTOXX® STRATEGY INDICES METHODOLOGY GUIDE

- September 2025: Creation of 'iSTOXX® Strategy Indices Methodology Guide' for former changes please refer to the iSTOXX® Equity Indices Methodology Guide