**DECEMBER 2023**

# STOXX®  DIGITAL ASSET METHODOLOGY GUIDE

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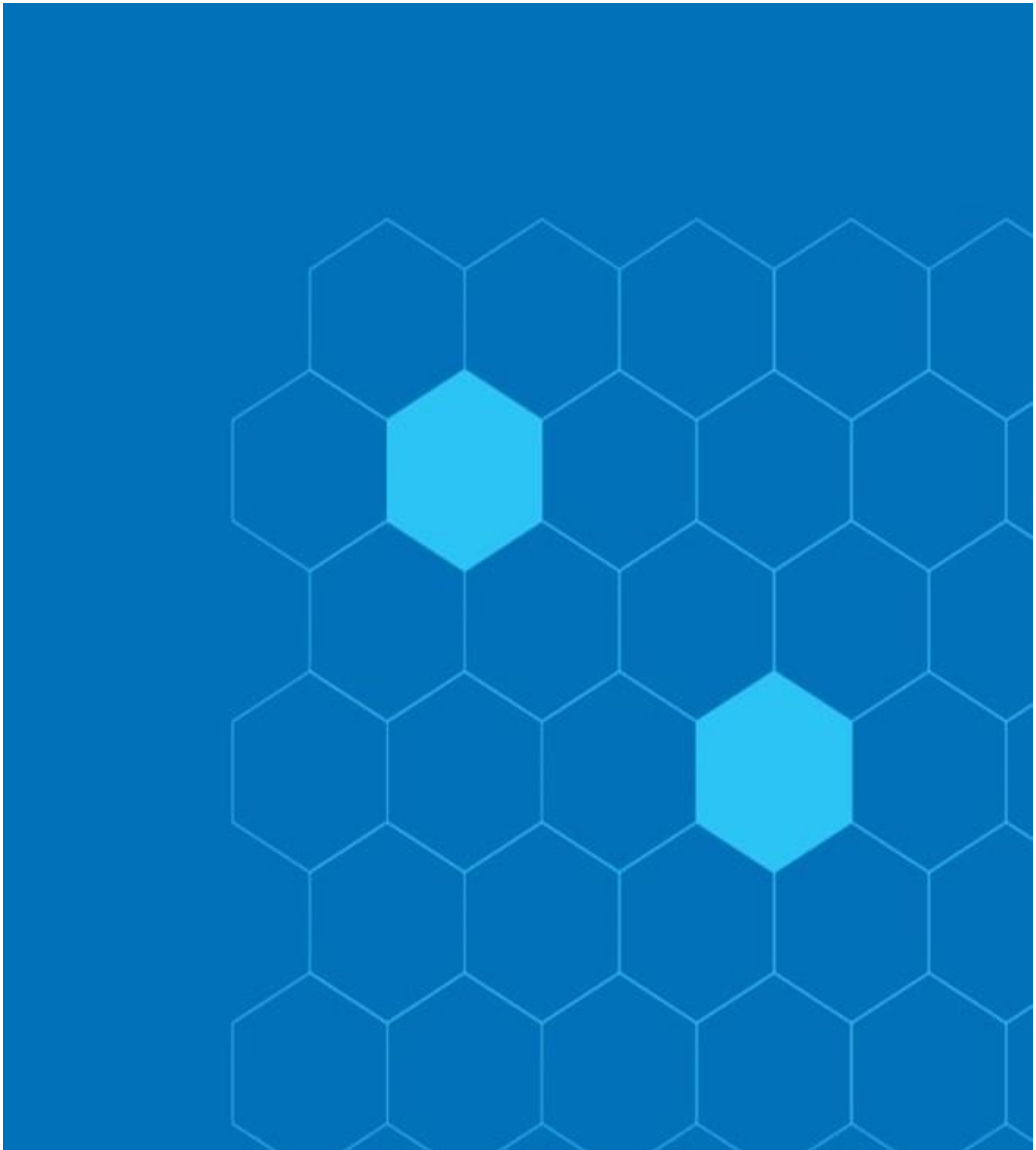
# CONTENTS

# 1. INTRODUCTION TO THE STOXX INDEX GUIDES

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 **STOXX ESG Index Methodology guide** contains the index specific rules regarding the construction and derivation of the ESG indices, the individual component selection process and weighting schemes

» The **iSTOXX Methodology guide** contains the index specific rules regarding the construction and derivation of the iSTOXX 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.

» The **STOXX Digital Asset Methodology guide** contains the index specific rules regarding the construction and calculation of the STOXX Digital Asset Indices.

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

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# 2. GENERAL PRINCIPLES

## 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. 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 advices 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.

## 2.3. PARTY RESPONSIBILITIES

STOXX, as the benchmark administrator, 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 on a periodic and an 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 Investors. Clarifications of the methodology are updated in the rulebook. All changes are tracked in the section 7, Changes to the Index Guide.

Bitcoin Suisse provides the Bitcoin Suisse Global Crypto Taxonomy (GCT), as described in section 3.2, reference pricing and the Bitcoin Suisse Base Exchange Score (BES) described in section 3.4, and data underlying the index selection.

# 3. INDEX CHARACTERISTICS

## 3.1. GLOSSARY OF TERMS

Below is an explanation of crypto specific terms that are used within the rulebook.

**Coin:** The term for the native and standalone digital asset specified by its own Layer-1 blockchain. A coin is to be separated from a token which has additional programmed functionality.

**Cryptoeconomic Security:** The underlying security infrastructure of a blockchain, provided either by proof-of-work, proof-of-stake or another security mechanism.

**Digital Asset:** Interchangeably also **Crypto Asset**: An umbrella term for coins and tokens.

**Effective Supply**: Also referred to as **Circulating Supply**, measuring the current outstanding supply of a token or coin at the current time. It excludes those tokens and coins that are subject to future issuance from the validation process, or locked up in extraordinary vesting schedules.

**Layer-1:** A base blockchain network that processes and finalizes transactions on its own blockchain. A Layer-1 network has an inherent source of cryptoeconomic security and does not rely on an external security source.

**Layer-2:** A blockchain layer that is separate from Layer-1 but relies fully or partially on a Layer-1's inherited cryptoeconomic security.

**Liquidity Pool Tokens:** Tokens that represent a user's respective share out of the total assets held in a liquidity pool, which is a collection of tokens locked in a smart contract to provide liquidity.

**Liquid Staked Tokens:** A tokenized representation of an underlying, stakeable crypto asset, which is received in return for staking the native crypto asset.

**Mainnet**: A fully developed, operationally functioning and running blockchain protocol that has been deployed as a distributed ledger technology (DLT). Separate from a testnet blockchain that is not operating at its full capacity.

**Market Capitalization:** Defined as the digital asset price multiplied by the effective supply.

**Smart Contract:** A program that runs when predetermined conditions are met.

**Staking**: Locking digital assets in order to support the cryptoeconomic security of a blockchain.

**Token:** The term for a digital asset, whose functional features are only limited by its implementation on top of a blockchain. Tokens are usually implemented via the deployment of smart contracts.

**Total Supply:** A measurement of the maximum supply of native tokens or coins that can be created on the respective underlying blockchain.

**Wrapped Tokens:** Wrapped tokens aim to represent the underlying value of another digital asset.

# 3. INDEX CHARACTERISTICS

A glossary with further terms can be found in the Bitcoin Suisse Global Crypto Taxonomy (GCT): https://bitcoinsuisse.com/crypto-taxonomy.

## 3.2. SECTOR CLASSIFICATIONS

The Bitcoin Suisse Global Crypto Taxonomy (GCT) is used to classify digital assets into representative sectors. The Bitcoin Suisse GCT is reviewed on a bi-annual basis, and is governed by a rules-based methodology, which can be found under https://bitcoinsuisse.com/crypto-taxonomy. A list of the sectors and sub sectors can be found in the Guide to Industry Classifications Used by STOXX.

## 3.3. ASSET UNIVERSE

The universe of assets for the STOXX Digital Asset Indices is reviewed bi-annually in March and September. The universe consists of any asset classified in the Bitcoin Suisse Index Reference Classification List (xRCL), for which the following eligibility criteria are met:

- Digital assets must be ranked in the Top 75 in regards to market capitalization, in accordance with the most recent publication of the Bitcoin Suisse xRCL.

- Digital assets, at the most recent date of publication of the Bitcoin Suisse xRCL, must have an active market on at least two exchanges covered by the Bitcoin Suisse eligible universe of contributing exchanges (see section 3.4.1).

- Digital assets, at the most recent date of publication of the Bitcoin Suisse xRCL, must be traded against both crypto quote currencies, BTC and ETH. They must also be traded against one, or more, of the following fiat currencies on an eligible exchange: USD, EUR, GBP, CHF, JPY, SGD. The most recent date of publication of the Bitcoin Suisse xRCL is the date applicable for both the exchange coverage, and the quote currency pairs.
  o Digital assets BTC and ETH are quote currencies and thus not subject to their own quote reference in the eligible universe of contributing exchanges.

- Digital assets within the Tokenized Asset sector of the GCT are not eligible. Additionally, digital assets that are functionally recognized as "Wrapped Tokens", "Liquid Staked Tokens" or "Liquidity Pool Tokens" are not eligible. Digital assets that are classified according to Bitcoin Suisse GCT in the subsectors "Stablecoin", "Other TradFi Instrument" and "Privacy Coin" are also not eligible.

Any forked assets of the eligible universe, as described in section 3.8, will join the eligible universe.

## 3.4. EXCHANGE SELECTION

In order to establish a robust pricing methodology the most appropriate exchanges must be selected for each asset. Reference prices are calculated using the average of executed

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# 3. INDEX CHARACTERISTICS

transactions across the two highest rated (principal) exchanges at any point in time. This section describes the steps taken in order to select the aforementioned principal exchanges.

### 3.4.1. UNIVERSE OF CONTRIBUTING EXCHANGES

For an exchange to be an eligible, contributing exchange, it must meet the following principles:

- It must offer spot trading.

- It must be regulated and/or supervised or operating for a minimum of three years.

- It must have provided constant and reliable spot trading market data for a minimum of one month.

- It must meet a minimum monthly volume threshold of USD 100 million total trading volume.

- It must be a clearly identifiable legal entity.

- It must adhere to regulations on sanctions, anti-money laundering and counter terrorism financing.

The current eligible universe of contributing exchanges is available on the STOXX website. More information regarding procedures to select, add, or remove exchanges can be found in the following sections.

### 3.4.2. BASE EXCHANGE SCORE

The Bitcoin Suisse Base Exchange Score (BES) is used to rank the exchanges in the Bitcoin Suisse Exchange Universe. The Bitcoin Suisse BES Methodology is a risk assessment framework which, by applying a set of criteria, scores the exchanges from 0 to 100. This allows the identification of the lowest risk exchanges for price determination purposes. Reviews of the BES are conducted monthly (or ad-hoc in extraordinary circumstances).
The BES is based on the criteria listed below:

- **Platform and User Security**: This set of criteria measures to what extent exchanges have paid close attention to platform and user security. Security criteria include: server security (such as Secure Sockets Layer (SSL) ratings), user security, the number of exchange/platform hacks and breaches within a certain period, the existence of bounty programs, penetration testing, and fund insurance.

- **Legal, Compliance, and Regulation:** This set of criteria measures to what extent exchanges comply with applicable laws and regulations. These include: the identification of the legal entity providing the services, its domicile and its applied compliance standards (KYC, AML, CFT, sanctions). It also includes the use of on-chain transaction monitoring systems, applicability of licensing and registration requirements (regulatory status), use of regulated and/or audited custodians, and information on the executive management of an exchange.

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- **Financial Information and Transparency:** This set of criteria measures the financial health of an exchange. Primary criteria here include: checking the willingness and frequency to provide up-to-date financial statements, adhering to financial requirements (such as profitability, leverage ratio, cash ratio, current ratio and debt to equity ratio) and the auditing of financial statements. Transparency criteria include checks on the Proof of Reserves (PoR) and Proof of Liabilities (PoL).

- **Track Record:** This set of criteria measures to what extent exchanges have experienced significant negative events, which would indicate a higher level of exchange risk. Such events include: data breaches and private information data leaks, the opening of legal proceedings, charges and fines, sanctions targeting an exchange and its executive management, arrests of senior executives, pending lawsuits, pending criminal charges, pending supervisory and administrative proceedings and any other significant events that may reasonably indicate a higher level of exchange risk.

### 3.4.3. VOLUME ADJUSTED SCORE

With the BES computed, a Volume Adjusted Score (VAS) is calculated using monthly trading volumes (MTV) per asset (i), per exchange (e). A Volume Adjustment Factor ($v_{i,e}$) is computed per asset, per exchange by comparing the monthly trading volume on the specific exchange to the total monthly trading volume across all eligible exchanges. This is calculated monthly, effective as of the BES Review Date (see section 3.5.1). The formula is as follows:

$$v_{i,e} = \frac{MTV_{i,e}}{\sum MTV_{i,e}}$$

This is then multiplied by the corresponding BES to give the VAS:

$$VAS_{i,e} = v_{i,e} \cdot BES_{i,e}$$

### 3.4.4. DECAYED VOLUME ADJUSTED SCORE

The VAS for each exchange is then time-decayed in order to give greater significance to more recent trades. The scores are used in tandem with the most recent trades per asset and per exchange to compute the Decayed Volume Adjusted Score (DVAS). This is done by multiplying the VAS by a decay factor. The decay factor is calculated as a function of a time-decay coefficient (λ) and the amount of time elapsed since the most recent trade (where the time of the last trade is defined as $T_e^{trade}$). This is then multiplied by the corresponding VAS. The time-decay coefficient is set as 0.001155245/s, with this value chosen as it reduces the DVAS by 50% after 10 minutes elapses with no trade activity. The DVAS for calculation time t is as follows:

$$DVAS_{i,e,t} = e^{-\lambda(t - T_e^{trade})} \cdot VAS_{i,e}$$

The two exchanges with the highest DVAS are selected as the principal exchanges ($PE_1$, $PE_2$).

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## 3.5. EXCHANGE MAINTENANCE

### 3.5.1. EXCHANGE REVIEW

For all exchanges, the BES are reviewed on a monthly basis, with updates taking effect at 00:00:00 UTC on the 15th calendar day (BES Review Date). For clarity, the BES for January will take effect on February 15th and the BES for February will take effect on March 15th. In the event Bitcoin Suisse is unable to generate a monthly exchange score, the BES of the previous month will be used.

### 3.5.2. EXCHANGE ADDITION AND REMOVAL

The universe of contributing exchanges, as well as potential new exchanges, will be reviewed and assessed monthly, based on the criteria covered by the Bitcoin Suisse BES Methodology and requirements set forth in section 3.4.1.

## 3.6. REFERENCE PRICE DETERMINATION

Once the principal exchanges have been established for a given asset, the final reference price can be determined

At a point of time, t, the asset reference price is simply the arithmetic average of the last executed trade prices from the two principal exchanges. The calculation at time is as follows:

$$p_{i,t} = \frac{1}{2}(p_{i,PE_1}^{trade} + p_{i,PE_2}^{trade})$$

Where:

$p_{i,PE_n}^{trade}$ = The price of the most recent trade as of time t, for asset i, on principal exchange n.

### 3.6.1. SAMPLE CALCULATION

The following table shows an example calculation for a given token. The two principal exchanges can be seen highlighted.

| Exchange | BES | VAS | Decay Factor | DVAS | Last Trade Time (CET) | Last Trade Price ($) |
|----------|-----|-----|--------------|------|-----------------------|----------------------|
| Coinbase | 87 | 54.0229806155 | 0.999629235 | 54.002950790 | **2023-04-18 16:59:59.679** | **10,198.32** |
| Kraken | 82 | 15.4932760918 | 0.996660001 | 15.441528560 | **2023-04-18 16:59:57.104** | **10,193.30** |
| Bitstamp | 79 | 7.23314266583 | 0.975837847 | 7.0583743632 | 2023-04-18 16:59:38.828 | 10,199.00 |
| Bitfinex | 41 | 3.91600697044 | 0.986311326 | 3.8624020263 | 2023-04-18 16:59:48.069 | 10,202.00 |

*Table 1: Sample asset reference price calculation, using the aforementioned method.*

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The prices of the two principal exchanges are averaged to give a price of: **$10,195.81.**

### 3.6.2. FALLBACK PROCEDURES

In the event that an asset price is unavailable (due to unforeseen circumstances, such as issues with the principal exchanges, issues in the price determination or in price transmission to STOXX), the previous available price will be used. This is applicable for open, intra-day and close asset prices. At the index open, if a price is unavailable for a particular asset, the previous day close price of the asset will be used. At the index close, if a price is unavailable for a particular asset, the last price before 17:00:00 CET will be used. Intra-day, the last available asset price will be used. Intra-day, if a price is unavailable for an extended period of time on a principal exchange, the last available price will be used until the exchange DVAS drops below the DVAS of the next highest rated exchange.

The following example calculation highlights the case in which there is no trade for an extended period of time on a given exchange (in this fictional case, Kraken). In this scenario, the principal exchange would switch once the DVAS of Kraken drops below the DVAS of Bitstamp.

| Exchange | BES | VAS | Decay Factor | DVAS | Last Trade Time (CET) | Last Trade Price ($) |
|----------|-----|-----|--------------|------|-----------------------|----------------------|
| Coinbase | 87 | 54.0229806155 | 0.999629235 | 54.002950790 | **2023-04-18 16:59:59.679** | **10,198.32** |
| Kraken | 82 | 15.4932760918 | 0.450625324 | 6.98166257 | 2023-04-18 16:47:29.904 | 10,193.30 |
| Bitstamp | 79 | 7.23314266583 | 0.975837847 | 7.0583743632 | **2023-04-18 16:59:38.828** | **10,199.00** |
| Bitfinex | 41 | 3.91600697044 | 0.986311326 | 3.8624020263 | 2023-04-18 16:59:48.069 | 10,202.00 |

*Table 2: Sample asset reference price calculation, highlighting the case of an extended trade-less period.*

The prices of the two principal exchanges are averaged to give a price of: **$10,198.66.**

## 3.7. CURRENCY RATES

The base currency for assets is USD. The following treatment describes the currency conversion from USD to other currencies:

- Intraday, the mid between the latest real-time bid and ask prices is used as the currency rate in order to calculate the indices for the Europe region.

- Close prices are calculated using the 17:00:00 CET WM spot rate provided by WM/Refinity.

## 3.8. INDEX CALCULATION

The indices are calculated using Laysperes formula as described in this section.

### 3.8.1. PRICE RETURN INDEX

The indices are weighted based on the components' reference prices and weighting factors:

$$Index_t = \frac{\sum_{i=1}^{n}(p_{it} \cdot wf_{it} \cdot x_{it})}{D_t} = \frac{M_t}{D_t}$$

Where:

t = Time the index is computed

n = Number of assets in the index

$p_{it}$ = Reference price of asset (i) at time (t) in index currency

$wf_{it}$ = Weight factor of asset (i) at time (t)

$x_{it}$ = Exchange rate from reference price currency to index currency at time (t)

$M_t$ = Total 'units' of the index at time (t)

$D_t$ = Divisor of the index at time (t)

### 3.8.2. DIVISOR CALCULATION

The index divisor is calculated as follows:

$$D_{t+1} = D_t \cdot \frac{\sum_{i=1}^{n}(p_{it} \cdot wf_{it} \cdot x_{it}) \pm \Delta MC_{t+1}}{\sum_{i=1}^{n}(p_{it} \cdot wf_{it} \cdot x_{it})}$$

Where:

$D_{t+1}$ = Divisor of the index at time (t+1)

$D_t$ = Divisor of the index at time (t)

n = Number of assets in the index

$p_{it}$ = Reference price of asset (i) at time (t) in index currency

$wf_{it}$ = Weight factor of asset (i) at time (t)

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$x_{it}$ = Exchange rate from reference price currency to index currency at time (t)

$\Delta MC_{t+1}$ = The difference between the units in the index at closing and the units in the index after calculation parameters have been adjusted: For assets with token events effective at time (t+1), the units in the index are calculated with adjusted closing prices and the adjusted weight factors at time (t+1) minus the units in the index calculated with closing prices and weight factors at time (t).

## 3.9. TREATMENT OF TOKEN EVENTS

Token events can be described as decisions undertaken by blockchain protocols due to fundamental changes in the development of a protocol. An overview of token event types, and their respective treatment, is given in this section.

### 3.9.1. HARD FORK

Hard fork refers to a hard blockchain fork that results in two or more non-backward-compatible blockchains.

The post-fork asset corresponding to the original asset remains in the index. The forked asset is not added to the index but is added to the eligible asset universe.

### 3.9.2. SOFT FORK

Soft fork refers to a soft fork of a blockchain where backwards compatibility with protocol rules run by old nodes is still given.

No action is taken in the event of a soft fork.

### 3.9.3. MIGRATION OF THE BLOCKCHAIN

Migration of the blockchain refers to the asset migration from one blockchain to another.

No action is taken in the event of a migration of the blockchain.

### 3.9.4. MIGRATION OF THE CONTRACT

Migration of the contract refers to the asset contract migration from one blockchain contract address to another.

No action is taken in the event of a migration of the contract.

### 3.9.5. REDENOMINATION

Redenomination refers to the revaluation of an asset at a ratio not equal to 1:1.

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No action is taken in the event of a redenomination.

### 3.9.6. MINTING

Minting refers to the increase of the circulating supply of an asset.

No action is taken in the event of minting.

### 3.9.7. BURNING

Burning refers to the decrease of the circulating supply of an asset.
No action is taken in the event of burning.

### 3.9.8. AIRDROPS

Airdrops refer to tokens distributed to token holders, usually for free or in return for a small service.

No action is taken in the event of an airdrop.

### 3.9.9. UNVESTING

Unvesting refers to any type of divesting that changes the circulating supply.

No action is taken in the event of an unvesting.

## 3.10. INDEX ELIGIBILITY EVENTS

The following section describes the actions to be taken in the event of a change of exchange or asset eligibility.

### 3.10.1. LACK OF EILIGIBLE EXCHANGE

If an asset ceases to trade on any eligible exchange, the asset will be removed from the index with a t+2 notice, with the last available asset price used during this notice period. The weight of the asset will be redistributed to the remaining index components, proportional to their index weights. If the asset is the sole index component, the index will be terminated at the conclusion of the notice period.

### 3.10.2. CHANGE IN ASSET ELIGIBILITY

If STOXX becomes aware, for any reason, that an asset has become ineligible for index selection, the token will be removed from the index with t+2 notice, with the last available asset price used during this notice period. The weight of the asset will be redistributed to the remaining index components, proportional to their index weights. If the asset is the sole index component, the index will be terminated at the conclusion of the notice period.

# 4. INDEX GOVERNANCE

Save for the cases expressly described in this guide, the index methodology is entirely rule-based and automatic. Discretion only applies if expressly stated and must be exercised as provided for in this guide.

## 4.1. USAGE OF DISCRETION

Discretion may be exercised by STOXX Committee(s) (as defined hereafter) with a view to resolve issues arising in maintaining the prevailing index methodology in response to events, with an overarching aim to accurately and reliably measure the market or economic realities as defined in this guide.

Discretion shall be exercised in line with the following principles:

- The body or person(s) exercising discretion must not be affected by a conflict of interest;

- The body or person(s) exercising discretion must have the requisite skills, knowledge and experience to exercise such discretion;

- All facts and circumstances relevant for the exercise of discretion must have been established and properly documented prior to the exercise of discretion;

- The exercise of discretion must comply with all applicable laws and regulations;
- The body or person(s) exercising discretion must act on the basis of the relevant facts and circumstances only, must give proper weight to the various considerations and ignore irrelevant facts and circumstances;

- The body or person(s) exercising discretion must act with a view to maintain the integrity of the market or economic reality by aiming to ensure that indices remain representative and can be replicated, taking into account, inter alia, some, or all of the following:
  - o Relevance of the event to the STOXX indices;
  - o Trading accessibility of the affected market;
  - o Availability of alternative markets;
  - o Ability of market participants to replicate the index or, where applicable, the results of the index review;
  - o Public information related to the events and their development in the foreseeable future ;

- The body or person(s) exercising discretion must act honestly, reasonably, impartially and in good faith. As part of the decision-making process, STOXX may consult with external stakeholders.

**Discretionary Rule**: Any exercise of discretion must take into account the rationale of the index, the purpose of the rules with regard to which discretion is exercised, the objective to preserve market integrity and reliability of the index calculation to avoid undue market impact, the technical feasibility and economic reasonability, and the interest of licensees or investors.

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The following committees (hereafter also referred to as "STOXX Committee(s)") are involved in the decision-making process relevant for the indices governed by this Guide:

- Index Operations Committee (IOC),

- Index Management Committee (IMC),

- Index Governance Committee (IGC),

- Product Approval Committee (PAC),

- Oversight Committee (OC),

- Management Board (MB).

The description of STOXX Governance Structure is available on www.stoxx.com in the section Resources / Index Regulations.

## 4.2. INDEX CORRECTION POLICIES

This section outlines the rules and procedures applicable in case of a calculation error, meaning the provision of index values, usage of index constituents or other elements or the application of weightings, capping, or other aspects of the index methodology in a manner that is not in line with this index methodology, e.g. due to a mistake, incorrect input data, etc.

### 4.2.1. RULE-BASED CORRECTION

STOXX corrects a calculation error without delay on the dissemination day it occurred, provided that STOXX becomes aware of the calculation error before 15:30 CET of that dissemination day, and insofar as technically and operationally feasible. STOXX does not change intraday index composition of an index.

If STOXX becomes aware of a calculation error at or after 15:30 CET, STOXX aims to correct the calculation error as of the end of the next dissemination day, including any corrections to index constituents.

STOXX amends, without undue delay, previous incorrect index values or input data only if they are required for the subsequent index value calculation. Incorrect real-time index values disseminated before the effective time of the correction are not restated.

### 4.2.2. NON RULE-BASED CORRECTION

If the above-outlined rule-based error correction cannot be applied, relevant STOXX Committees assesses without undue delay:

▪ If and how the calculation error should be corrected, including if the index shall be restated, and/or

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▪ If the dissemination of index values shall be suspended (Discretionary Rule, see section 4.1).

An index should be restated when the performance of the index can no longer be replicated. A suspension of index dissemination is triggered when STOXX Committee decides that the correction will take significant time, during which misleading index values could lead to financial, legal and reputational risks (Discretionary Rule, see section 4.1).

At the latest, STOXX suspends the dissemination of an index at the end of the dissemination day after it became aware of a calculation error, if the calculation error has not been corrected by then. STOXX will resume the dissemination of the index as soon as the correct index calculation is feasible, and the correct historical values are available.

## 4.3. LIMITATIONS

This section applies in the event of limitations that occur due to:

- Insufficient rules, meaning the absence of a methodology rule, provision or procedure which leads to a failure when determining the respective index value or which leads to an index value that does not properly reflect the concept/nature of the index, e.g.:
  - o Performance of the index can no longer be physically replicated,
  - o Insufficient index constituents to fulfil the requirements of the index methodology;

- Unclear rules, meaning a situation in which the rules leave multiple possible interpretations on how a certain rule shall be applied to a specific situation;

- Data insufficiency, meaning a scenario in which the calculation of an index is no longer possible due to insufficient data quantity or quality;

- Failure to produce index values as intended;

- Market disruption which results in the performance of the index being unable to be tracked;

- Events with a market impact that by their nature could reasonably not be foreseen, or events whose impact on an index or the economic reality the index intends to represent, cannot be determined in advance. Events covered in this section include, but are not limited to, events of natural, social, political, economic nature that may negatively impact regional or global societies or economies. Examples may be, but are not limited to, the following: (i) change to currency convertibility or restriction on capital flows announced by a country; (ii) market disruption, e.g. an event that materially negatively influences the aggregated liquidity, capitalization or tradability of an entire market; (iii) exchange closure, (iv) government intervention, (v) pandemic, (vi) natural catastrophe.

If a limitation has occurred, the IGC shall decide if and how the limitation shall be rectified (Discretionary Rule, see section 4.1). Any such rectification may comprise deviations from the index methodology which may apply as long as the limitation persists (Discretionary Rule, see section 4.1).

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# 4. INDEX GOVERNANCE

In this context, STOXX may also decide to cancel an index review. If a limitation that could justify the cancellation of an index review occurs two or fewer dissemination days before the scheduled review implementation day, the review will be performed as planned, if reasonably possible. This aims to avoid last minute changes and not undermine the trading activity that may have already been performed.

If a review is cancelled, STOXX aims to perform it at the next scheduled review of the index or at the next quarterly review date (3rd Friday of March, June, September and December), whichever comes first and subject to the then prevailing market conditions.

If a decision to deviate from the index methodology is taken, it will be communicated as soon as possible in form of an announcement or press release. STOXX will refrain from the issuance of a notification if it reaches the view that the issuance of a notification is not in line with applicable laws and may decide to issue such notification at a later point in time when such reasons have lapsed (Discretionary Rule, see section 4.1). By reason of force majeure or other events beyond the control of STOXX it might become impossible for STOXX to issue a notification in due time or by the means set out herein. In such cases STOXX may exceptionally issue the notification either subsequently immediately following such event or in any case by other means. Any measures will be implemented two dissemination days later and will enter into effect the next dissemination day after implementation, unless a different effective date is specified in the notification.

# 5. STOXX DIGITAL ASSET BLUE CHIP INDEX

## 5.1. INDEX DESCRIPTION

The STOXX Digital Asset Blue Chip Index tracks a diversified basket of assets, utilizing crypto native metrics to select those which serve as a reflection of the crypto universe today. The index tracks the performance of those assets which are deemed to be 'blue chip' in terms of quality, activity, robustness and financial strength.

## 5.2. INDEX INFORMATION

The index is calculated as a price weighted index with capped weighting factors, in accordance with Laysperes formula as described in section 3.8.

**Index Base Values and Base Dates:** 1000 as of 22/03/2021.

**Index Types and Currencies:** Price Return in USD and EUR.

**Index Dissemination:** Index calculated realtime from 09:00:00 – 17:50:00 CET. Official close price is the price as of 17:00:00 CET.

**Index Dissemination Calendar**: STOXX Global Calendar.

## 5.3. INDEX REVIEW

### 5.3.1. SELECTION CRITERIA

Assets are selected based on a multi-step procedure which seeks to identify the strongest and most representative assets in each eligible sector of the Bitcoin Suisse GCT. At each review, a set of crypto-specific review metrics are calculated and used to rank the assets within their respective sectors, with this, in turn, determining the final index composition.

#### 5.3.1.1. METRIC DEFINITIONS

The assets will be ranked based on the following five metrics:

**Age:** The number of calendar days since the earliest protocol interaction on a mainnet.

**Total Value Secured (TVS**): The total economic value, expressed as the aggregate USD value of the entirety of all crypto assets that are being secured by the underlying cryptoeconomic security mechanism.

**Active Addresses:** The number of unique sending blockchain addresses participating in protocol interactions over one day.

**Economic Activity:** The value in USD of the fees paid by users to participate in protocol interactions over the course of one day.

# 5. STOXX DIGITAL ASSET BLUE CHIP INDEX

**Developer Community:** The size of the developer community on a protocol over one month as measured by the count of active full-time developers and the community size.

### 5.3.1.2.   METRIC FORMULAE

In order to appropriately consider the selection metrics, quantitative methods for ranking assets within their respective sectors are established. The following calculations are done at review for each token. The rankings described are done from 1 to n, where n is the number of assets in the corresponding asset sector, and rank 1 is given to the best scoring asset.

### Age

The age metric is defined by the Age Ranking (AR). The age of a given asset is ranked against the ages of all other assets in the sector. The asset with the greatest age (the most calendar days since the first mainnet interaction) is ranked highest.

### TVS

The TVS metric is considered by calculating the TVS Ratio (TVSR). For a given asset, this is defined as the ratio of the 3 month daily average TVS, and the sum of the 3 month daily average TVS in the asset's sector. The TVSR is defined by the following formula:

$$TVSR_{Asset} = \frac{TVS_{Asset}}{TVS_{Sector}}$$

The assets are ranked from highest to lowest TVSR.

### Active Addresses

The active addresses metric is considered by calculating the Active Addresses Ratio (AAR). For a given asset, this is defined as the ratio of the 3 month daily average number of active sending addresses, and the sum of the 3 month daily average number of active sending addresses in the asset's sector. The AAR is defined by the following formula:

$$AAR_{Asset} = \frac{Active\ Addresses_{Asset}}{Active\ Addresses_{Sector}}$$

The assets are ranked from highest to lowest AAR.

### Economic Activity

The economic activity metric is considered by calculating the Economic Activity Ratio (EAR). For a given asset, this is defined as the ratio between the 3 month daily average total fees ($F_{Asset}$), and the sum of the 3 month daily average total fees in the asset's sector ($F_{Sector}$). The EAR is defined by the following formula:

$$EAR_{Asset} = \frac{F_{Asset}}{F_{Sector}}$$

# 5. STOXX DIGITAL ASSET BLUE CHIP INDEX

The assets are ranked from highest to lowest EAR.

**Developer Community**

The developer community metric is considered by calculating the Developer Community Ranking (DCR). This is done by first calculating the Community Size Ratio (CSR):

$$CSR_{Asset} = \frac{\left(Dev_{Asset}^{Total} - Dev_{Asset}^{One-Time}\right)}{Dev_{Asset}^{FT}}$$

Where:
$Dev_{Asset}^{Total}$ = The total number of developers for a given asset.
$Dev_{Asset}^{One-Time}$ = The number of one-time developers for a given asset.
$Dev_{Asset}^{FT}$ = The number of full-time developers for a given asset.

The assets are ranked from highest to lowest CSR.

Separately, the number of full-time developers is considered for each asset. The assets are ranked from the highest to the lowest number of full-time developers.

These two rankings are then combined to give the DCR, which is defined by the following formula:

$$DCR_{Asset} = Rank(CSR_{Asset}) + Rank(Dev_{Asset}^{FT})$$

The assets are ranked from lowest to highest DCR. If, after calculation, two or more assets have the same DCR, then precedence is given to the assets with the greater number of full-time developers. If no full-time Developers exist for an asset it will score zero for this metric.

**Composite Asset Score**

After considering the metric formulae, assets are assigned a Composite Asset Score (CAS). If, for a given metric, an asset ranks in the top 50% of its respective sector, it is assigned a score of 1, otherwise it is assigned a score of 0.

If there is an odd number of assets in a sector, the number of assets assigned a score of 1 is rounded down. For example, if a sector has 11 assets, 5 assets will be assigned a score of 1.

If asset data is unavailable for any given metric, the asset will be assigned a score of 0 for that corresponding metric.

For a given asset, the CAS is calculated as follows:

$$CAS_{Asset} = AR_{Asset} + TVSR_{Asset} + AAR_{Asset} + EAR_{Asset} + DCR_{Asset}$$

.
Assets with a CAS of 4 (or greater) will be selected to be in the index composition.

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# 5. STOXX DIGITAL ASSET BLUE CHIP INDEX

### 5.3.1.3. INDEX BUFFERING

Buffering will be used in order to maintain stability and continuity in the index composition. If an asset is an existing component of the index, then the asset will only require a CAS of 3 (or greater) to remain in the composition. This rule is valid for two consecutive reviews for any existing component. If an existing component has failed to achieve a CAS of 4 (or greater) for two consecutive reviews, it must achieve a CAS of 4 (or greater) in the subsequent review to retain its index membership. For example, if an asset is in the index prior to June review, then it will only require a CAS of 3 to be selected in the subsequent June and September review cycles. If the asset did not achieve a CAS of 4 in either June or September review, the asset will then require a CAS of 4 to be selected in the December review.

### 5.3.2. INDEX COMPOSITION

Assets which pass the selection process are weighted according to market capitalization, with capping at the individual asset level set at 30%.

### 5.3.2.1. INDEX WEIGHTING

The index is weighted by market capitalization with capping. The capped weights ($cw_i$) are derived from the initial market capitalization weights via an iterative process that seeks to maintain the following condition:

- A single asset weight does not exceed 30%.

Excess weight is redistributed to the remainder of uncapped components, proportionally to their current weights in the capping iteration. This process repeats until the capping requirements are met.

In the case where the number of constituents is not sufficient to fulfil the capping requirements, the index is equal-weighted.

### 5.3.2.2. WEIGHT FACTOR CALCULATION

Weight factors are based on the closing prices in USD ($p_i$) of the dissemination day preceding the second Friday of the review month using the following formula (rounded to the nearest integer):

$$Weight\ Factor_i = \frac{100,000,000,000 \cdot cw_i}{p_i}$$

### 5.3.2.3. TRIVIAL WEIGHT RULE

In the event that the finalized capped weight of an asset is less than 0.5%, it will be removed from the index. This excess weight will then be redistributed to components below the capping limit, proportionally to their current index weights. Component weights after the redistribution are confined to the index capping limit and excess weight will redistributed to the remaining constituents that are below the capping limit, proportionally to their current index weights.

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# 5. STOXX DIGITAL ASSET BLUE CHIP INDEX

### 5.3.3. REVIEW FREQUENCY

The review is conducted on a quarterly basis in March, June, September and December, based on the eligible universe that is determined bi-annually in March and September.

The cut-off date for the review metric data is the last calculation day of February, May, August and November respectively. In the event that the metric data is not delivered before the $2^{nd}$ Friday of the review month, the data from the previous review will be used.

Weight factors are calculated on the $2^{nd}$ Friday of each review month using the prices from the preceding dissemination day. The weight factors will be published five dissemination days prior to the corresponding $3^{rd}$ Friday.

All changes are effective as of the open of the first dissemination day following the $3^{rd}$ Friday of each review month.

In the event of a change in the eligibility of the composition, the review files will be republished two dissemination days prior to the review date.

## 5.4. ONGOING MAINTENANCE

**Replacements:** Assets that are deleted between review periods are not replaced.

**Token Events:** See section 3.9.

**Lack of Eligible Exchange:** See section 3.10.

# 6. STOXX DIGITAL ASSET BLUE CHIP X INDEX

## 6.1. INDEX DESCRIPTION

The STOXX Digital Asset Blue Chip X Index provides exposure to the tradeable assets within the underlying STOXX Digital Asset Blue Chip Index. By incorporating only Xetra eligible tokens, the index ensures a fully replicable and transparent investment product.

## 6.2. INDEX INFORMATION

The index is calculated as a price weighted index with capped weighting factors, in accordance with Laysperes formula as described in section 3.8.

**Index Base Values and Base Dates:** 1000 as of 22/03/2021.

**Index Types and Currencies:** Price Return in USD and EUR.

**Index Dissemination:** Index calculated realtime from 09:00:00 – 17:50:00 CET. Official close price is the price as of 17:00:00 CET.

**Index Dissemination Calendar**: STOXX Global Calendar.

## 6.3. INDEX REVIEW

### 6.3.1. INDEX COMPOSITION

The index is comprised of all assets in the STOXX Digital Asset Blue Chip Index that are also present in the most recent list of Xetra eligible tokens.

The list of eligible tokens can be found under https://www.xetra.com/xetra-en/instruments/etfs-etps/fokus-crypto-etns.[1]

The selection of assets is done in accordance with section 5.3.1, with ineligible assets removed before index buffering treatment, as set out in section 5.3.1.3.

Assets which pass the above selection process are weighted according to market capitalization, with capping at the individual asset level set at 30%.

### 6.3.1.1. INDEX WEIGHTING

The index is weighted by market capitalization with capping. The capped weights ($cw_i$) are derived from the initial market capitalization weights via an iterative process that seeks to maintain the following condition:

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[1] The direct link is as follows:
https://www.xetra.com/resource/blob/3511012/f975533f3bd2c79507554fb6b22a2864/data/overview-crypto.xlsx

# 6. STOXX DIGITAL ASSET BLUE CHIP X INDEX

- A single asset weight does not exceed 30%.

Excess weight is redistributed to the remainder of uncapped components, proportionally to their current weights in the capping iteration. This process repeats until the capping requirements are met.

In the case where the number of constituents is not sufficient to fulfil the capping requirements, the index is equal-weighted.

### 6.3.1.2. WEIGHT FACTOR CALCULATION

Weight factors are based on the closing prices in USD ($p_i$) of the dissemination day preceding the second Friday of the review month using the following formula (rounded to the nearest integer):

$$Weight\ Factor_i = \frac{100,000,000,000 \cdot cw_i}{p_i}$$

### 6.3.1.3. TRIVIAL WEIGHT RULE

In the event that the finalized capped weight of an asset is less than 0.5%, it will be removed from the index. This excess weight will then be redistributed to components below the capping limit, proportionally to their current index weights. Component weights after the redistribution are confined to the index capping limit and excess weight will redistributed to the remaining constituents that are below the capping limit, proportionally to their current index weights.

### 6.3.2. REVIEW FREQUENCY

The review is conducted on a quarterly basis in March, June, September and December, based on the eligible universe that is determined bi-annually in March and September.

The cut-off date for the Xetra eligible token list is the dissemination day preceding the second Friday of the review month.

The cut-off date for the review metric data is the last calculation day of February, May, August and November respectively. In the event that the metric data is not delivered before the 2nd Friday of the review month, the data from the previous review will be used.

Weight factors are calculated on the 2nd Friday of each review month using the closing prices from the preceding dissemination day. The weight factors will be published five dissemination days prior to the corresponding 3rd Friday.

In the event of a change in the eligibility of the composition, the review files will be republished two dissemination days prior to the review date.
All changes are effective as of the open of the first dissemination day following the 3rd Friday of each review month.

# 6. STOXX DIGITAL ASSET BLUE CHIP X INDEX

## 6.4. ONGOING MAINTENANCE

**Change in Asset Xetra Eligibility:** See section 3.10.

**Replacements:** Assets that are deleted between review periods are not replaced.

**Token Events:** See section 3.9.

**Lack of Eligible Exchange:** See section 3.10

# 7. CHANGES TO THE INDEX GUIDE

## 7.1. HISTORY OF INDEX GUIDE CHANGES

December 2023: Publication of the Index Methodology guide.

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