

BITA

Index Methodology Guidebook

BITA Crypto 20 XA Index

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Log of Amendments

1) 15.06.2018 - v1.0. First publication of methodology guide
2) 20.09.2019 - v1.1. Addition of specification of ADTV minimum thresholds
3) 16.12.2019 - v1.2. BMR Benchmark Statement Considerations have been included
4) 06.05.2020 - v 1.3. Amendment on Exit buffer rule.
5) 17.08.2021 - v 1.4. Inclusion of ESG Disclosure.

Introduction and Background

ABOUT THE INDEX

The **BITA Crypto 20 XA Index** aims to provide a transparent and objective measure of the Total Return Performance of a basket of leading cryptocurrencies, measured against the US dollar, trading at well-established digital asset exchanges. Anonymous (Privacy) currencies are excluded from the index and a 1% cash constituent is added. Index values are calculated and disseminated in real-time in EUR.

ABOUT BITA

BITA is a Germany-based Fintech that provides enterprise-grade indexes, data and infrastructure to institutions operating in the passive and quantitative investment spaces. Thanks to its innovative index software, designed to outperform other existing solutions in terms of flexibility and speed, BITA can provide independent, methodologically-sound indexes that are both investable and replicable by customers and stakeholders. BITA's methodologies and processes are completely transparent and available publicly.

ABOUT THIS DOCUMENT

This document is published to serve as a guidebook of the methodologies adopted in the construction, calculation and management of the index.

Any methodological changes or alterations to this document are performed by the BITA Index Management Board (BIMB) and authorized by the BITA Oversight Function, following the directives of both the "BITA Index Methodology Policy" and the Regulation (EU) 2016/2011 "Benchmark Regulation" (BMR). The index is owned, calculated, administered and disseminated by BITA GmbH.

Index Characteristics and Specifications

1. GENERAL INFORMATION AND INDEX OBJECTIVES

The BITA Crypto 20 XA Index, from here on referred to as "the index", provides a transparent and objective measure of the Total Return Performance of a basket of leading cryptocurrencies, measured against the US dollar, trading at well-established digital asset exchanges. The index excludes any currencies that are classified as anonymous or privacy currencies and adds a cash constituent of 1%. The main characteristics of the index are:

- **Ticker:** B20XA
- **Inception Date:** 15.06.2018
- **Index value at inception:** 5.000
- **Return calculation:** Price Return
- **Weighting mechanism:** Free Float Market Capitalization (based on circulating supply)
- **Rebalancing frequency:** Monthly rebalancing, quarterly reconstitution
- **Capping Factor:** 25% cap on weights at rebalancing
- **Number of constituents:** 20 plus a 1% EUR cash constituent
- **Calculation currency:** Index is calculated and disseminated in EUR

2. EU BENCHMARKS REGULATION CONSIDERATIONS AND STATEMENT

BITA GmbH is the benchmark "administrator" of the BITA Crypto 20 XA Index, the "Benchmark" or "Index". (a)

The Index is calculated based on readily available data and does not use any contributed input data (as defined in Article 3(1)(8) of the BMR). The Index is classified as a non-significant benchmark (as defined in Article 3(1)(27) of the BMR).

The Index does not pursue Environmental, Social, and Governance (ESG) objectives and does not take into account ESG factors. The Index is not classified as EU Climate Transition Benchmark (as defined in Article 3(1)(23a) of the BMR) or EU Paris-aligned Benchmark (as defined in article 3(1)(23b) of the BMR).

For the complete Benchmark Statement on the BITA Crypto 20 XA Index, please refer to the "BITA Governance Policies".

This Methodology guide should be read in conjunction with the BITA Crypto 20 XA Index Benchmark Statement and other associated BITA Governance policies and methodology documents. Those documents are highlighted whenever referenced in this Methodology guide. They are also available on the BITA website (https://www.bitadata.com/governance.html).

(a) The term administrator is used in this document in the same sense as it is defined in Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds (the "Benchmarks Regulation" or "BMR").

3. INPUT DATA

3.1 Sources

In line to the input data requirements under the Article 11 of the Regulation (EU) No 596/2014 (the "Benchmarks Regulation" or "BMR"), the BITA Crypto 20 XA Index does not use contributions of input data, which may be prone to contributor discretion. A contribution of input data is defined as such data not readily available to an administrator or to another person for the purposes of passing to an administrator that is required in connection with the determination of a benchmark, and is provided for that purpose. See Article 3(1)(8) of the EU Regulation 2016/1011 of the European Parliament and of the Council of 8 June 2016.

To calculate index constituent prices, BITA sources consolidated trade data (last sale) from a variety of well-established exchanges that have been approved and whitelisted by the BIMB. The Exchange Whitelist is reviewed and re-assessed at every rebalancing date. An Exchange monitoring process has been established as an ongoing continuous process to ensure that extraordinary events do not affect the ability of the index to accurately represent the market.

All input prices are based on actual transactions. Several quantitative and qualitative processes are in place to determine and validate input prices, such as automated outlier filters and data monitors.

3.2 Input Data Filtering

In order to ensure stable, reliable input data. The following processes are applied for the determination of each currency's spot exchange rate (CSR):

A. Non-whitelisted exchanges are excluded
B. An outlier filter for exchange sourced trades with a 10% threshold (compared to previous CSR).
C. Any last sale price that is 10% higher or lower than the last calculated consolidated price (CSR) is not considered.
D. When two or more exchanges contribute prices in a 1 second CSR, the spread between the lowest price from the contributing exchanges and the highest price from the contributing exchanges is measured. If the spread is less than 3%, then all prices are averaged. If the spread between the lowest and the highest prices is more than 3%, then the exchange which is the farthest away from the average price of the exchanges contributing a price is excluded.

For the determination of BTC's price, only USD trading pairs are considered. For the determination of all other currencies, only BTC trading pairs are considered.

3.3 Exchange Monitoring

BITA assess every exchange on three dimensions: governance, qualitative factors and quantitative factors:
Exchanges are assessed on governance through whether the exchange:
- is open
- is accessible for most investors
- has regulatory blacklisting, investigations or sanctions

- has sound governance in terms of due processes and the avoidance of conflicts of interest within the ownership and management structures
- makes its data available

Exchanges are assessed on qualitative factors through whether the exchange:
-has an API market feed with streaming capabilities
-has over 1 year of operation
-is accessible in English
-is locatable and contactable
-is in an acceptable jurisdiction (outside of the FATF blacklist)
-implements sound AML procedures
-has satisfactory KYC processes
-has overall integrity in its operation, with no major scandals having been verified
-has necessary redundancy and system robustness
-permits utilization of data for derived data calculation purposes

Exchanges are also assessed on the following quantitative factors:
-does not show significant price differences from peers for the same assets on a consistent basis
-does not show clear signs of market manipulation
-the exchange represents more than 0.5% of the daily traded volume for currency "i"

If an exchange fulfills all these criteria to satisfactory levels, it will be in the BITA Whitelist. Only trades occurring in Whitelist exchanges are taken into account to determine CSRs.

3.4 Currency Monitoring

Currencies subject to blacklisting or fraudulent flagging from regulatory authorities will not be considered for index compositions. BaFin is used as the reference regulatory authority, but others may be referred to for guidance.

An ADTV (Average Daily Traded Value) floor has been established, to avoid inclusion of currencies with low liquidity. Currencies must have at least 5.000.000 USD in ADTV during the last 5 trading days before reconstitution.

In addition, currencies must be traded on at least two Whitelisted exchanges to be considered.

For more detailed information on specific guidelines regarding the types of Input data, the procedures for the control of input data and the exercise of expert judgement please refer to the "BITA Input Data Policy".

4. INDEX CALCULATION AND DISSEMINATION FREQUENCIES

4.1 Calculation Methodology

The index is based on the Laspeyres formula, which links each successive weighted basket of instruments in the index with the preceding basket. This translates into a unique index "Divisor" for each index, which is adjusted to maintain the continuity of the index's values across changes.

4.2. Calculation Frequency

The index is calculated intraday in real-time during the index dissemination period. Historical "EoD" index data is available as backfilled data starting on the index backtesting start date, and as calculated and maintained data starting on the index inception date.

4.3 Calculation Input

The index's input data is calculated based on the conventional Cryptocurrency quoting format, sourced from Whitelisted Exchanges.

Each input value is calculated as a simple average of the last validated exchange rates (last sale updates that have gone through the input data filtering process) from contributing exchanges, within a 1-minute timeframe.

For determining the index weights at each rebalancing, circulating supply data extracted from the individual's currency distributed ledger (when available) is utilized. Otherwise, Circulating Supply data is extracted from CMC.

4.4 Index Dissemination

Intraday Calculation and Dissemination of the Index occurs every Business Day between 00:00 (Index Open) and 23:00hrs (Index Close) UTC. A day is considered to be a Business Day if at least one of the exchanges considered in the Index is open for trading.

The index is distributed via BITA's real-time APIs as well as a variety of data vendors when applicable.

Composition of the Index

1. INVESTABLE INDEX UNIVERSE

1.1. Selection of Index Constituents

The 20 constituent pairs have been selected based on their Free Float Market Capitalization ranking. Circulating supply is used as a proxy for the calculation of the currencies float.

2. INDEX REVIEW SCHEDULE

2.1 Ordinary Reviews

The Ordinary Index Reviews happen on the 3rd Friday of every calendar month at 10:00 UTC. The "Proforma Day" for ordinary adjustments is the Monday preceding the 3rd Friday of the rebalancing month.

Reconstitution buffers: 15% top and bottom buffers

Fast entry/exit mechanisms: None

2.2 Extraordinary Reviews

This Index has no Extraordinary Index Reviews.

Index Calculation

1. INDEX FORMULA

The index value is calculated in real-time in EUR with the updated price from its constituent pairs using the following formula:

$$Index_t = \sum_{i}^{n} \frac{CSR_{i,t} * CS_{i,t} * AWF_{i,t} * SR_t}{D_t}$$

Where:
CSRi,t= Crypto Spot exchange rate 'i' expressed in units of USD at time t
SRt= EUR/USD Spot exchange rate at time t
CSi,t= Circulating Supply of Cryptocurrency "i" at time "t"
AWFi,t= Adjustable Weighting Factor for Crypto Spot Rate "i" at time "t"
Dt= Divisor Value at time "t"

2. INDEX DIVISOR

In order to insulate the index from the effect of changes in the Circulating Supply or Index Constituents (additions and deletions), the index's market capitalization is divided by an adjustment factor called the index divisor.

During the trading day, the index is computed by dividing the index's current market capitalization by the divisor value. If there are no changes in Circulating Supply or index constituents, the divisor remains unchanged for the next trading day. If there is an event resulting in a capitalization change, the index's new adjusted base market capitalization is calculated after the index close using adjusted prices and circulating supply figures. In this case, a new divisor is calculated for use at the opening on the next trading day.

The new divisor will link the closing index value to the new adjusted base market capitalization of the index.

The initial divisor value is calculated according to the following formula:

$$D_t = \sum_{i}^{n} \frac{CSR_{i,t} * CS_{i,t} * AWF_{i,t} * SR_t}{Initial\ Index\ Value}$$

On each Adjustment Day t, the divisor is adjusted to keep the index value constant. The new divisor is calculated as:

$$D_{t+1} = D_t + \frac{Change\ in\ Market\ Cap\ of\ the\ Index}{Index\ Value_t}$$

Where Market Value of the Index is the total traded value, calculated as the sum of all Crypto Spot Rate Market Values (Crypto Spot Exchange Rate "i" multiplied by Circulating Supply of Cryptocurrency "i").

The new divisor is then used in the calculation of the following day's index open.

If the Circulating Supply of an index constituent changes by more than 10% due to a corporate action, the company's Circulating Supply will be updated after the close of the trading day, and a Divisor adjustment is triggered.

3. COMPUTATIONAL ACCURACY

CSRs are calculated to 8 decimals.

Index values will be rounded to 2 decimal places for dissemination and storage.

Divisors and weights are rounded to 4 decimal places.

4. CORPORATE ACTIONS

In the case of Crypto Indexes, and specifically the BITA Crypto 20 XA Index, the scope of applicable Corporate Actions is limited to Forks.

4.1 Forks

In the case of the BITA Crypto 20 XA Index, Forks do not trigger automatic adjustments on Regular Index Reviews. Any discretion which may need to be exercised in relation with a significant Hard Fork, shall be made in accordance with strict rules regarding the exercise of expert judgment, and in consultation with clients and stakeholders.

5. CORRECTION AND RECALCULATION

To ensure accuracy, timeliness and consistency of indexes that accurately reflect economic realities, BITA has implemented an Index Correction and Recalculation Policy. Our policy has been drafted in accordance with the IOSCO Principles and the EU Benchmark Regulation directives.

As per our Index Correction and Recalculation Policy, processes are in place to reduce error likelihood, ensure timeliness of identification, avoid subjectivity of corrective decisions and mitigate impact to clients.

While every effort is taken to ensure the accuracy of the index inputs, information and calculation, there is no guarantee that the index will be error-proof. Errors may occur due to data input errors, technology errors, application errors or other reasons.

Any Correction or Restatement made to an Index will be normally communicated to clients via email channels. The communication is done in a standardized format including an explanation of the error, the proposed rectification and the effective date of implementation. BITA's customer service and product development teams stand always available for any additional clarification if necessary. Upon request, error reports are made available to clients.

For detailed information on specific errors, implementation timing and correction processes, please refer to the "BITA Correction and Recalculation Policy".

6. MARKET DISRUPTION

In periods of market stress, that might result in inaccurate market prices, delayed data inputs, illiquid constituents or fragmented markets, BITA calculates the Index following predetermined procedures as set out in its "BITA Index Termination and Business Continuity Policy", available at BITA's website.

Index Governance and Miscellaneous

1. METHODOLOGY ADJUSTMENTS AND REVIEWS

The Index Methodology is reviewed on an annual basis by both the BITA Index Management Board and the BITA Oversight Committee, to make sure the Index continues to reflect the economic realities of the market and is not based on obsolete inputs or assumptions.

In case an adjustment to the Methodology is required, a detailed written "BITA Index Methodology Policy" outlines the steps and approvals required to develop, document and approve and Index and its Methodology. The purpose of the BITA Index Methodology Policy is to ensure that the methodology of the Index meets the requirements of Article 12 of the BMR and is implemented according to a robust and reliable process.

2. INDEX LIMITATIONS

The following is a summary of certain risks and limitations linked to the Index. Although the Index is conceived to be representative of the underlying market it measures, it may not be representative of every use case. It is designed and calculated strictly to follow the rules of this methodology, and any Index level is limited in its usefulness to such design and calculation.

• The Index methodology is designed for general applicability and not to tackle the individual needs of Index users. BITA does not advise as to the usefulness of the Index on any particular circumstance, hence, users are encouraged to strive for their own counsel on these matters.

• The Index methodology is subject to change and may impact its worth to users as well as the usefulness of the Index. Although efforts will be made to notify users about any material changes in the methodology, not every individual user may be aware of them.

• Cryptocurrencies' market can be more volatile relative to other markets. As the goal of the Index is to represent this market, it could be significantly impacted by market movements, and, consequently, thus markedly affecting the use or usefulness of the information for some or all users.

• Periods of illiquidity can arise in the Cryptocurrencies' market. Illiquidity can affect the amount or quality of data available to BITA for the calculation of the Index and may cause the estimation of unpredictable Index levels.

• A fair valuation calculation for a constituent might be challenging due to the fragmented liquidity across many trading venues, which could lead to unsettling volatility in Index performance.

• Circulating Supply may be subject to unpredictable change which can derive in a change of the Cryptocurrency weightings of the index.

The procedures described in this methodology may concede a significant degree of discretion to the Index Administrator in a number of matters. In all cases, the Index Administrator may exercise discretion as it determines in good faith and in a reasonable manner. Furthermore, this methodology does not address all possible issues relating to the Index, related indices or sub-indices; any omissions or exceptions may be addressed as considered to be appropriate.

3. INDEX TERMINATION

When designing an index, BITA puts significant efforts in ensuring that its indexes are sustainable and can stay relevant over time. However, there might be situations (cases where an index ceases to reflect the economic reality of the market it represents, needs data that can no longer be obtained, or fails to keep achieving its objectives) where a cessation of the index may be indicated. For such cases, BITA has developed and adopted an "Index Termination Business Continuity Policy", that includes the specific processes to identify such events, communicate and consult stakeholders, and setup potential transition plans to reduce the impact for customers and stakeholders.

4. INDEX GOVERNANCE BODIES

4.1. BITA Oversight Function

The BITA Oversight Function is responsible for the oversight of all aspects related to the provision of benchmarks administered by BITA. The Oversight Function will receive updates from first-line internal governance bodies where appropriate.

4.2. BITA Index Management Board (BIMB)

The BITA Index Management Board (BIMB) is responsible for decisions regarding the index composition as well as any changes to the rulebooks and methodology guides. The board also decides about the future composition of the index if any "Extraordinary Event" occurs and requires necessary adjustments.

5. ESG FACTORS DISCLOSURE

Explanation of how ESG Factors are reflected in the key elements of the benchmark methodology:

Name of the benchmark administrator.	**BITA GmbH**
Type of benchmark or family of benchmarks. Choose the relevant underlying asset from the list provided in Annex II to Commission Delegated Regulation (EU)2020/18	Crypto
Name of the benchmark or family of benchmarks	**BITA Crypto 20 XA Index**
Does the benchmark methodology for the benchmark or family of benchmarks pursues an ESG objective?	No
Does the benchmark methodology for the benchmark or family of benchmarks take into account ESG factors?	No

Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets.

(a) List of environmental factors considered:	**By Exclusion:** None. **By Selection:** None. **By Weighting:** None.
(b) List of social factors considered:	**By Exclusion:** None. **By Selection:** None. **By Weighting:** None.
(c) List of governance factors considered:	**By Exclusion:** None. **By Selection:** None. **By Weighting:** None.

For benchmarks and family of benchmarks pursuing ESG objectives, the ESG factors shall be disclosed at an aggregated weighted average value at the level of the family of benchmarks.

Data and standards used

(a) Data input	
(i) Describe whether the data are reported, modelled or sourced internally or externally. **(ii)** Where the data are reported, modelled or sourced externally, please name the third party data provide	**Not Applicable.**

6. TERMINOLOGY

Inception Date refers to the official start date of the index, with the index base value as open value.

Price Return Index is an index that does not take into consideration any reinvestment of dividends in the return calculation, therefore only capturing capital gains.

Business Day is a day on which the relevant markets are open for trading.

End of Day (EoD) is the index value that is calculated and stored by taking the close price at the end of each business day.

Proforma Day is the day used as a reference for the calculation (at end of day) of index weights and constitutions.

Circulating Supply is the number of cryptocurrency coins or tokens that are publicly available and circulating in the market.

Market Value is the total traded value, calculated as the sum of all Crypto Spot Rate Market Values (Crypto Spot Exchange Rate "i" multiplied by Circulating Supply of Cryptocurrency "i").
The index Divisor is an arbitrary number that is first defined when an index is first published. Its initial use is to divide the total value of the index to produce an index value that is easy to handle. Subsequently, the index divisor remains constant and requires adjustments when rebalancing.

Adjustable Weighting Factor (AWF) is the adjustment factor introduced in the index calculation formula so that the index constituent weight capping factor is satisfied.

The AWF for each constituent on the rebalancing date is calculated as

$$AWF = \frac{CW}{W}$$

Where CW is the Capped Weight of that index constituent on the proforma date and W is the weight of the index constituent if it was not capped on the proforma date.

Coordinated Universal Time (UTC) is the primary time standard by which the world regulates clocks and time.

FATF Blacklist: The FATF is an independent inter-governmental body that develops and promotes policies to protect the global financial system. The FATF blacklist or OECD blacklist has been issued by the Financial Action Task Force since 2000 and lists countries which it judges to be non-cooperative in the global fight against money laundering and terror funding.

Airdrops: An airdrop occurs when a new or emergent crypto asset is granted to holders of an existing crypto asset on a one-off or occasional basis. Airdrops are not native to the internal return drivers of any given crypto asset. They also require agency on the part of crypto asset holders to claim, and the act of claiming those assets can potentially put holders of a given crypto asset at risk.

Hard Forks: Hard forks are new crypto assets that are granted to holders of existing crypto assets when portions of the consensus nodes adopt different policies. In the event of a hard fork, holders of an existing crypto asset end up with ownership of both the original crypto asset and the new, hard-forked crypto asset.

Benchmark Regulation (BMR): Regulatory regime for benchmark administrators that ensures the accuracy and integrity of benchmarks. Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 governing Indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds and amending Directives 2008/48/EC and 2014/17/EU and Regulation (EU) No 596/2014.

7. DISCLAIMER

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The publication of the Index by BITA does not constitute a recommendation for capital investment and does not contain any assurance or opinion of BITA regarding a possible investment in a financial instrument based on this Index.

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