

# CF Rolling CME Bitcoin Ether Basket Futures Index (Excess Return)

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## Methodology Guide

**Version:**

1.3

**Version Date:**

06<sup>th</sup> February 2024

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# 1 Version History

Version	Date Issued	Summary of Change	Owner
V1.0	10 <sup>th</sup> October 2023	n/a	CF Benchmarks Product Management
V1.1	13 <sup>th</sup> November 2023	Update to logo and format	CF Benchmarks Marketing
V1.2	20 <sup>th</sup> November 2023	Updated logo (AKC v2)	CF Benchmarks Marketing
V1.3	06 <sup>th</sup> February 2024	Updates to the Administrator communication procedures for Delayed Calculation & Publication; Calculation Failure; Restatement & Republishing and Market Failure Events	CF Benchmarks Compliance Officer

## 2 Introduction

### 2.1 Index Aims

The CF Rolling CME Bitcoin Ether Basket Futures Index tracks the performance of a basket consisting of 1) the CF Rolling CME Bitcoin Futures Index (Excess Return) and 2) the CF Rolling CME Ether Futures Index (Excess Return). The basket constituents are weighted by their respective Free Float market capitalizations and rebalanced quarterly.

The Index has been designed to be investible and to be used as a benchmark as defined by **the UK Benchmarks Regulation (“UK BMR”)** including for:

- The performance benchmarking of actively managed portfolios of Digital Assets and determine relative performance
- The passive replication in investment funds and financial instruments and products
- The settlement of financial instruments including derivative contracts
- As a means of valuing or “marking to market” portfolio holdings of digital assets.

### 2.2 Requirements

For the Index to meet its stated aims it must:

- Accurately represent the prevailing values of the constituents indices in the base currency of the Index
- Apply a constituent weighting mechanism that accurately reflects the quantity of physical Bitcoins and Ether (*whose exchange in the open market the constituent indices are an inter alia representation of as per Section 2.3*) available in the open market
- Be able to accurately represent the real-world distribution scenarios for index constituents
- Be replicable without incurring unreasonable costs or unacceptable risks for investors
- Be capable of calculation and administration in a reliable and robust manner in accordance with all CF Benchmarks Administration Policies and the provisions of **UK BMR**

### 2.3 Underlying Economic Reality

The Index is intended to measure the underlying economic reality of the value of the constituent CF Rolling CME Futures Indices as held in a weighted portfolio that seeks to deliver the returns of holding relevant contracts of Bitcoin-USD and Ether-USD Futures made available for trading by the CME Group. Whilst the constituent indices do not observe the transactions of physical Bitcoin for USD and Ether for USD (and vice versa) as input data, they do represent the underlying economic reality of the exchange of Bitcoin for USD and Ether for USD. The CME Bitcoin Futures contracts and the The CME

Ether Futures contracts are cash settled to the CME CF Bitcoin Reference Rate (BRR) and the CME CF Ether Reference Rate (ETHUSD\_RR) respectively, each global daily benchmark prices of one Bitcoin denominated in USD and one Ether denominated in USD, that are also provided by the Administrator. The BRR and ETHUSD\_RR are calculated by observing the transactions involving the exchange of Bitcoin for USD and Ether for USD (and vice versa) that are conducted on cryptocurrency exchanges that meet the CME CF Constituent Exchange Criteria, inter alia the CME Bitcoin-USD futures contracts and the CME Ether-USD futures contracts are themselves representations of the underlying economic reality of the exchange of Bitcoins for USD and Ether for USD.

## 3 Parameter Table

### 3.1 Index Parameter Table

<b>Index Name</b>	<b>CF Rolling CME Bitcoin Ether Basket Futures Index (Excess Return)</b>
<b>Ticker</b>	CFCMBEBF_BEB
<b>Inception Date</b>	2 October 2023
<b>Inception Value</b>	1,000
<b>Base Currency</b>	USD
<b>Constituents</b>	CF Rolling CME Bitcoin Futures Index: CFCMBTCF_BTC CF Rolling CME Ether Futures Index: CFCMETHF_ETH
<b>Underlying Reference Rates</b>	CFCMBTCF_BTC: CME CF Bitcoin Reference Rate - New York Variant (BRRNY)  CFCMETHF_ETH: CME CF Ether-Dollar Reference Rate - New York Variant (ETHUSD_NY)
<b>Constituent Pricing Sources</b>	CF Benchmarks Pricing Sources
<b>Calculation &amp; Publication Time</b>	15:20 Central Time
<b>Calculation &amp; Publication Frequency</b>	Once a day, in line with calculation and publication days of the: <ul style="list-style-type: none"> <li>• CF Rolling CME Bitcoin Futures Index; and</li> <li>• CF Rolling CME Ether Futures Index</li> </ul>
<b>Constituent Weighting</b>	Free Float Market Capitalization Weighted
<b>Rebalance Frequency / Month</b>	Quarterly – on days 6, 5 and 4 prior to Expiry Day of the Front Contract as defined in the CF Rolling CME Bitcoin Futures Index and CF Rolling CME Ether Futures Index Methodologies for the following months: February, May, August, November. During a rebalance month, the index is therefore rebalanced on the same dates as the underlying CF Rolling CME Futures Indices are rebalanced.
<b>Rebalance Determination Time</b>	16:00:00 UTC on the day which is 8 business days prior to Expiry Day of Front Contract as defined in the CF Rolling CME Bitcoin Futures Index and CF Rolling CME Ether Futures Index Methodologies.
<b>Rebalance Implementation Time</b>	On the Calculation & Publication time

## 3.2 Constituent Observation Windows and Partition Lengths

	Partition Length	Partition Count	Time Zone: Central Time	
			Window Start	Window End
CFCMBTCF_BTC	8 hours	4	07:00	15:00
CFCMETHF_ETH	8 hours	4	07:00	15:00

## 3.3 Expert Judgement

The Administrator does not utilise expert judgement in the day-to-day calculation of the index. In extraordinary circumstances Expert Judgement may be exercised by the Administrator in the calculation, constituent review and rebalance procedure for the index. This will be done in accordance with its codified policies and processes which are available upon request.

## 4 Index Calculation Method

### 4.1 Definitions

Symbol	Name	Description
$t$	Effective time	The time at which the index is calculated
$r_i$	Rebalance Determination Time	The time when the rebalance parameters are determined for the $i^{th}$ rebalance
$k_i$	Rebalance Implementation Time	The time when the rebalance parameters are implemented for the $i^{th}$ rebalance
$c \in C_i$	Index Constituents	The list of constituents that are determined to be index constituents for the $i$ th rebalance
$p_t^c$	Constituent Pricing Source	The price of constituent $c$ at time $t$
$g_{r_i}^c$	Supply	The supply of constituent $c$ calculated as the Free Float Supply based on the Total Supply Likely to be Available for Trading as detailed in CF Benchmarks Multi Asset Index Ground Rules – Section 4 Constituent Weighting.
$s_{r_i}^c$	Adjusted Supply	The supply of constituent $c$ adjusted to assure that the market cap weighting is based on the price of the underlying digital asset (as opposed to Rolling Futures Index values)
$q_{r_i}^c$	Reference Rate	The price of the underlying digital asset of the relevant constituent $c$ , as defined under Parameters (3)
$d_{k_i}$	Divisor	Divisor used for the $i^{th}$ rebalance
$I_t$	Index value	Index value at time $t$

### 4.2 Index Calculation

The index value is some factor times the sum for all constituents of the products of the constituent's supply and price:

$$I_i^B = \frac{1}{d_i} \sum_{c \in C} p_t^c * s_{r_i}^c$$

Where B is a basket index.

Where  $d_i$  is the divisor needed for the index value to be continuous. The divisor is used to scale the index so that the value of the index is fixed at inception and continuous at each rebalancing. The divisor factor shall be:



$$\{d_{k_1} = \frac{1}{I_{k_1}} \sum_{c \in C_1} s_{r_i}^c p_{k_1}^c \quad \forall i \geq 2, d_{k_i} = d_{k_{i-1}} \cdot \frac{\sum_{c \in C_i} s_{r_i, T-x+1}^c p_{k_i}^c}{\sum_{c \in C_{i-1}} s_{r_i, T-x}^c p_{k_i}^c}$$

The Index initial value is  $I_{k_1} = 1000$  if not specified otherwise in the Index Parameter Table.

T refers to the expiration date of the front contract and x refers to the respective roll day in the roll window.

The Supply and Adjusted Supply relation is as follows:

$$s_{r_i}^c = \frac{g_{r_i}^c * q_{r_i}^c}{p_{r_i}^c}$$

Free Float supply determination for each roll day during a rebalance month:

During a quarterly rebalance month, the difference between the old and the new Free Float supplies (calculated on the Rebalance Determination Date) is amortised linearly over the period of the Roll Window. At the end of the Roll, the basket weights are representative of the Free Float supplies snapped on the Rebalance Determination Date.

Roll Day 1 (T-6)	$g_{r_i, T-6}^c = (g_{r_i}^c - g_{r_{i-1}}^c) * 1/3 + g_{r_{i-1}}^c$
Roll Day 2 (T-5)	$g_{r_i, T-5}^c = (g_{r_i}^c - g_{r_{i-1}}^c) * 2/3 + g_{r_{i-1}}^c$
Roll Day 3 (T-4)	<p><math>g_{r_i, T-4}^c = (g_{r_i}^c - g_{r_{i-1}}^c) * 3/3 + g_{r_{i-1}}^c</math>, i.e. the Free Float supplies <math>g_{r_i}^c</math> snapped on Rebalance Determination Date i. For the avoidance of doubt, the following are true:</p> $g_{r_i, T-4}^c = g_{r_i}^c$ $g_{r_{i-1}, T-4}^c = g_{r_{i-1}}^c$

The relevant Roll Dates are defined in accordance with the relevant holiday schedules in the CF Rolling CME Bitcoin Futures Index and CF Rolling CME Ether Futures Index Methodologies.

## 5 Contingency Calculation Rules

There may be instances where the Index cannot be calculated according to the calculation methodology.

### 5.1 Delayed Calculation and Dissemination

Where any Constituent Pricing Source for the calculation of the index is delayed, missing or otherwise not available for any index calculation time the index value(s) shall be deemed delayed, where no index value will be published. The index shall resume publication when valid Constituent Pricing Source(s) are published.

Where any Constituent Pricing Source for the calculation of the index is delayed, missing or otherwise not available for a Rebalance Implementation Time, the index value(s) on and subsequent from Rebalance Implementation Time shall be deemed delayed, where no index value(s) will be published. The index shall resume publication when valid Constituent Pricing Source(s) are published.

Where for the above or any reason the Administrator is not able to calculate and publish the index within the Dissemination Time on any given Calculation Day then the Administrator shall clearly communicate to all licensees via Statuspage that calculation and publication has been delayed. The Administrator will seek to publish the Index for that Calculation Day as soon as it is able to.

### 5.2 Calculation Failure

If the index cannot be calculated for a given Calculation Day before 23:59:59 London time, for instance because:

- A Constituent Pricing Source for the calculation time is not published, or published but not retrieved by the Calculation Agent before 23:59:59 London time
- Any other reason or circumstance that prevents the orderly calculation of the index

Then the index value for that calculation day is given by the index value on the previous calculation day and this index value shall be published with a marker of (\*).

The occurrence of any index calculation failure is reported to the CF Oversight Function. Any Calculation Failure events will be clearly communicated to all licensees via Statuspage.

## **6 Restatement & Republishing**

The Index is subject to restatement and republishing before 23:59:59 London time of any given Calculation Day due to republication of underlying Constituent Pricing Sources, or errors made by the Calculation Agent or its systems. The index shall not be subject to republishing after this time.

### **6.1 Restatement and Republishing of the Index Level**

The Administrator shall only Restate and Republish the index on any given Calculation Day if the Administrator can restate and republish the index before 23:59:59 London time of the given calculation day. The Administrator shall clearly communicate to all licensees via Statuspage that a restatement and republishing of the index will take place for that Calculation Day.

The Administrator shall restate the index as soon as possible after the restated Constituent Pricing Source(s) has been published or the errors made by the Calculation Agent or its systems are acknowledged and shall do so by overwriting the previously published Index level. The Administrator will determine at its own sole discretion, and with best endeavours, if a restatement and republishing of an index settlement price is appropriate in the circumstances. The Administrator reserves the right not to restate and republish any index levels. Where restatement and republishing is deemed appropriate, this restated index level will carry no mark when published and will be final and not subject to any further change or republication.

The index shall not be restated if any Determination Price(s) is republished.

## 7 Methodology Review and Changes to the Index

This methodology is subject to internal review by the Administrator and the CF Cryptocurrency Index Family Oversight Function (“**the Oversight Function**”) at least annually.

Any changes to this methodology are overseen by the Oversight Function, and in accordance with the UK BMR Article 13.

All *material* changes to the methodology shall only be implemented after a consultation process with users and relevant stakeholders that shall be conducted according to the Administrator’s policies and overseen by the Oversight Function.

Should the Administrator deem it necessary to cease providing the Index it shall only do so after a consultation process with users and relevant stakeholders that shall be conducted according to the Administrator’s policies and overseen by the Oversight Function.

## 8 Contact Information

### CF Benchmarks Ltd

Address	Contact
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