

# CF Options Settlement Rate Methodology

**Version: 1.0**

**31st March 2025**

# Contents

|          |   |           |
|----------|---|-----------|
| <b>1</b> | <b>Version History</b>                      | <b>3</b>  |
| <b>2</b> | <b>Overview</b>                             | <b>4</b>  |
| <b>3</b> | <b>Definitions</b>                          | <b>5</b>  |
| <b>4</b> | <b>Methodology</b>                          | <b>6</b>  |
| 4.1      | Qualitative Description . . . . .           | 6         |
| 4.2      | Mathematical Representation . . . . .       | 6         |
| <b>5</b> | <b>Contingency Calculation Rules</b>        | <b>8</b>  |
| 5.1      | Delayed Data and Missing Data . . . . .     | 8         |
| 5.2      | Erroneous Data . . . . .                    | 8         |
| 5.3      | Delayed Calculation & Publication . . . . . | 8         |
| 5.4      | Expert Judgment . . . . .                   | 8         |
| 5.5      | Calculation Failure . . . . .               | 9         |
| <b>6</b> | <b>Restatement &amp; Republishing</b>       | <b>10</b> |
| <b>7</b> | <b>Parameters</b>                           | <b>11</b> |
| <b>8</b> | <b>Settlement Price Specifications</b>      | <b>13</b> |
| <b>9</b> | <b>Methodology Review and Changes</b>       | <b>14</b> |

# 1 Version History

| Version | Date Issued   | Summary of Change | Owner                    |
|---------|---------------|-------------------|--------------------------|
| v1.0    | 19 March 2025 | N/A               | CF Benchmarks Management |

## 2 Overview

The CF Options Settlement Rate (OPTRR) is designed to measure the underlying economic reality of cryptocurrency spot markets through a robust time-weighted average price methodology.

By averaging RTI values over a defined observation window, the OPTRR mitigates the impact of intraday volatility and irregular trading activity. This results in a representative price that reflects broad market consensus rather than transient price movements.

The design and implementation of the OPTRR lends itself to be used as a daily rate to allow for the orderly settlement of options contracts and other derivative instruments.

### 3 Definitions

- **API:** Application programming interface.
- **Calculation Day:** Any day for which OPTRR is published.
- **Relevant Real Time Index:** The Real Time Index referenced by the Relevant OPTRR.
- **Constituent Exchange:** A cryptocurrency trading venue to serve as pricing source for the Relevant Real Time Index, as defined in Section 7.
- **Relevant Pair:** The cryptocurrency base asset versus the quote asset  $r$  referenced by the Relevant OPTRR, as defined in Section 7.
- **Retrieval Time:** One minute after the end of the TWAP Period on a given Calculation Day, as given by the server clock of the Calculation Agent.
- **TWAP Period:** A period of time equal to the TWAP Period Length leading up to the Effective Time, as defined in Section 7.

## 4 Methodology

### 4.1 Qualitative Description

The OPTRR is calculated based on the Relevant RTI (Real Time Index) values calculated from the specific Constituent Exchanges, as listed in Section 7. Calculation steps on any given Calculation Day are as follows:

1. The Relevant RTI values are calculated based on Section 4 of [CME CF Cryptocurrency Real Time Indices Methodology](#).
2. All Relevant RTI data are collected during the TWAP Period, with each entry including both the timestamp and the corresponding index value.
3. The sum of the recorded RTI values is divided by the total number of RTI to produce the final time-weighted settlement price.

### 4.2 Mathematical Representation

The following table shows the symbols used in the mathematical representation of OPTRR:

| Symbol                       | Name                        | Description   | Type      |
|------------------------------|-----------------------------|---|-----------|
| $T$                          | Effective Time              | The time as of which the OPTRR is calculated  | Parameter |
| $\tau$                       | TWAP Period Length          | The length of the time-period prior to the effective time during which real time index values are collected | Parameter |
| $RTI$                        | TWAP Period RTIs            | The RTI values in the TWAP Period   | Input     |
| $I$                          | TWAP Period RTI Index Count | The total number of real time index values in the TWAP Period   | Output    |
| $rti_i$ with $rti_i \in RTI$ | Real Time Index data point  | The $i$ th real time index value in the TWAP Period   | Input     |
| $OPTRR_T$                    | OPTRR                       | The OPTRR at time $T$   | Output    |

The OPTRR as of the effective time  $T$ ,  $OPTRR_T$ , is then given by:

$$OPTRR_T = \frac{\sum_{i=1}^I rti_i}{I} \quad (\text{Eq. 1})$$

## 5 Contingency Calculation Rules

### 5.1 Delayed Data and Missing Data

Delayed data and missing data are treated according to the following rules:

1. Where Relevant Real Time Index values exist but cannot be retrieved by the Calculation Agent before the Index Publication Time then they will be disregarded from the relevant index calculation for that Calculation Day.
2. If no Relevant Real Time Index values exist on a given Calculation Day, then a Calculation Failure Event shall be declared by the Administrator (see Section 5.5).

### 5.2 Erroneous Data

If a Real Time Index values in the TWAP Period has a negative index value, it is flagged as erroneous, then a Calculation Failure Event shall be declared by the Administrator (see Section 5.5).

### 5.3 Delayed Calculation & Publication

Where for any reason the Administrator is not able to calculate and publish the index within the Publication Time on any given Calculation Day then the Administrator shall clearly communicate to all licensees via Statuspage informing index users 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. Should the Administrator not be able to calculate and publish the index by 23:59:59 London time then the provisions of Rule 5.5 shall come into effect.

### 5.4 Expert Judgment

The Administrator does not utilise expert judgment in the day-to-day calculation of the Settlement Prices. In extraordinary circumstances Expert Judgement may be exercised by the Administrator in accordance with its codified policies and processes which are available upon request.



## 5.5 Calculation Failure

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

- no Relevant Real Time Index value exist on that Calculation Day, or
- one or more Relevant Real Time Indices exist but for any reason cannot be retrieved by the Calculation Agent, or
- any of the Real Time Index values has a negative index value, or
- any other reason or circumstance that prevents the orderly calculation of OPTRR,

then the OPTRR for that Calculation Day is given by the OPTRR on the previous Calculation Day and this Settlement Price value shall be published with a marker of (\*), subject to Restatement & Republishing Rules. The occurrence of a calculation failure of the index is reported to the CF Oversight Function.

## 6 Restatement & Republishing

The Administrator may restate and republish the index value where the published value is found to be incorrect. This will only occur if both the below conditions are met:

1. Timeliness – where the Administrator can RESTATE and REPUBLISH the index value before 23:59:59 of the given Calculation Day.
2. Materiality – where the RESTATED OPTRR has an absolute variance greater than 0.20% for the average value for the given Calculation Day.

Example:

- The index on a given Calculation Day is published as 1234.56
- The index will only be RESTATED if the average is:
  - Greater than 1237.03
  - OR
  - Less than 1232.09

Where the above conditions are met 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 and shall do so by overwriting the previously published index value. This restated index value will carry no mark when published and will be final and not subject to any further change or re-publication.

## 7 Parameters

| Parameter                     | CF Bitcoin Options Settlement Rate           |
|-------------------------------|--|
| Ticker Symbol                 | BTCOPTRR                                     |
| Relevant Pair                 | Bitcoin vs. USD                              |
| Relevant Real Time Index      | CME CF Bitcoin Real Time Index               |
| Constituent Exchange          | <a href="#">CME CF Constituent Exchanges</a> |
| Effective Time ( $T$ )        | 8:00:00 a.m. UTC                             |
| TWAP Period Length ( $\tau$ ) | 30 minutes                                   |
| TWAP Period                   | 7:30:01 a.m. to 8:00:00 a.m. UTC             |

| Parameter                     | CF Ether Options Settlement Rate             |
|-------------------------------|--|
| Ticker Symbol                 | ETHOPTRR                                     |
| Relevant Pair                 | Ether vs. USD                                |
| Relevant Real Time Index      | CME CF Ether-Dollar Real Time Index          |
| Constituent Exchange          | <a href="#">CME CF Constituent Exchanges</a> |
| Effective Time ( $T$ )        | 8:00:00 a.m. UTC                             |
| TWAP Period Length ( $\tau$ ) | 30 minutes                                   |
| TWAP Period                   | 7:30:01 a.m. to 8:00:00 a.m. UTC             |

| Parameter                     | CF Solana Options Settlement Rate            |
|-------------------------------|--|
| Ticker Symbol                 | SOLOPTRR                                     |
| Relevant Pair                 | Solana vs. USD                               |
| Relevant Real Time Index      | CME CF Solana-Dollar Real Time Index         |
| Constituent Exchange          | <a href="#">CME CF Constituent Exchanges</a> |
| Effective Time ( $T$ )        | 8:00:00 a.m. UTC                             |
| TWAP Period Length ( $\tau$ ) | 30 minutes                                   |
| TWAP Period                   | 7:30:01 a.m. to 8:00:00 a.m. UTC             |

## 8 Settlement Price Specifications

|                         | <b>CF Bitcoin Op-<br/>tions Settlement<br/>Rate</b>                 | <b>CF Ether Options<br/>Settlement Rate</b> | <b>CF Solana Op-<br/>tions Settlement<br/>Rate</b> |
|-------------------------|---|---|--|
| Administrator           | CF Benchmarks Ltd   |   |  |
| Calculation Agent       | CF Benchmarks Ltd   |   |  |
| Description             | U.S. Dollar price of the Relevant Pair as of 8:00 a.m. UTC time     |   |  |
| Calculation Methodology | Arithmetic average of real time index values during the TWAP period |   |  |
| Dissemination Time      | Once per day, every day, at 8:01:00 a.m. UTC                        |   |  |
| Dissemination Precision | 0.01 U.S. Dollars   |   |  |

## 9 Methodology Review and Changes

This methodology is subject to internal review by the Administrator and 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.

## Contact Information

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