



Hard Fork Policy

CF Cryptocurrency Index Family

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1 Version History

Version	Date	Changes
1	14 th November 2018	N/A
2	12 th December 2018	Expansion of Provisions Related to Contentious Hard forks
3	12 th July 2019	Rebrand to CF Benchmarks
4	1 st September 2019	Update legal text with BMR registration
4.1	13 th May 2020	Addition of new applicable indices
5.0	31 st July 2020	Changes to Definition of: <ul style="list-style-type: none">• Original Token• New Token
5.1	25 th Aug 2020	Addition of new applicable indices

2 Scope

This CF Cryptocurrency Index Family Hard Fork Policy applies to all members of the CF Cryptocurrency Index Family, below is a full list of current members:

- CF Ripple-Dollar Settlement Price
- CF Ripple-Dollar Spot Rate
- CF Ripple-Bitcoin Settlement Price
- CF Ripple-Bitcoin Spot Rate
- CF Bitcoin Cash-Dollar Settlement Price
- CF Bitcoin Cash-Dollar Spot Rate
- CF Litecoin-Dollar Settlement Price
- CF Litecoin-Dollar Spot Rate
- CF EOS-Dollar Settlement Price
- CF EOS-Dollar Spot Rate
- CF Stellar Lumens-Dollar Settlement Price
- CF Stellar Lumens-Dollar Spot Rate
- CF Tezos-Dollar Settlement Price
- CF Tezos-Dollar Spot Rate
- CF PAX Gold-Dollar Settlement Price
- CF PAX Gold-Dollar Spot Price
- CF Bitcoin-Euro Settlement Price
- CF Bitcoin-Euro Spot Rate
- CF Ether-Euro Settlement Price
- CF Ether-Euro Spot Rate

3 Overview

Cryptocurrencies and digital assets are built upon networks governed by “consensus rules”. These rules determine whether transactions on their respective blockchains are valid. Any change to these consensus rules must be implemented by all parties for the system to function on a continuous, unified basis. In particular, the entities validating transactions (miners) must conform to any changes to be able to continue to validate transactions and maintain network functionality and stability.

When consensus rule changes are proposed they will affect the software code that the blockchain operates on and all the users of the network that are active on the blockchain are expected to implement these changes. Should the proposed changes mean that there is compatibility with nodes that do not implement the change (backwards compatibility) then this is known as a “soft fork”. Due to this backwards compatibility “soft forks” will not be likely to affect the integrity of benchmarks that measure the value of cryptocurrencies or tokens that undergo them.

However, where the proposed changes break the compatibility with nodes that do not implement the changes then this is potentially a “hard fork” When any nodes of the blockchain refuse to conform to the new consensus rules and implement the new software this may case a hard fork to occur, and may result in the creation of a new blockchain and associated new token.

4 Hard Fork Events

4.1 Definition

A hard fork is deemed to have occurred if:

1. two or more divergent blockchains are in existence post-fork that share the same pre-fork blockchain,
2. the tokens on the post-fork chains are non-fungible across chains, and
3. the respective blockchains are actively mined such that transactions can be processed at reasonable speed.

To ensure the integrity of the CF Cryptocurrency Index family of benchmarks where a cryptocurrency that is an underlying asset of a benchmark within the family undergoes a hard fork event then the materiality of the hard fork will be evaluated against a set of pre-defined criteria to determine whether the hard fork and resultant new token is material.

4.2 Material Hard Fork and Resultant New Token Determination Criteria

For the purpose of benchmark index calculation and dissemination, a hard fork and the resultant new token will be deemed material if after the first 7 full Days following a hard fork, it has met all the below criteria on at least 2 consecutive Days:

- The New Token Pair must be available to trade on at least 2 constituent exchanges
- The Token Pair trades at a price greater than or equal to 10% of the combined Price of both the Original Token Pair and the New Token Pair.
- The Trading Volume of the New Token Pair must be greater than or equal to 10% of the combined Trading Volume of the Original Token Pair and the New Token Pair.

4.3 Materiality is Met

If a New Token is deemed material, the Administrator will initiate the calculation and dissemination of a Hard Fork Benchmark on the New Token Pair without undue delay.

4.4 Materiality is Not Met

If a New Token is not deemed material, then there will be no benchmark for the new token as a result of the hard fork situation. The administrator may launch a new benchmark for the new token through its normal benchmark launch procedures.

4.5 Contentious Hard Forks

In extreme circumstances hard fork situations can be contentious. A contentious hard fork is one where a hard fork has occurred according to the definition laid out in 4.1 but further to this the two sides do not agree to the forking and dispute one or more of the below:

- Which of the two chains will be the “true” successor of the original chain and hence be the “true” successor coin
- Which of the two chains and their respective coins will represent the ticker symbol on spot exchanges and hence represent the original coin
- In extreme circumstances the resultant dominant chain may seek to re-organise the competing and unified historical chains such that it can control the administration of the historical chain

This situation can be further complicated by spot exchanges that are utilised as input data sources having different policies concerning:

- Which node implementation they will operate and protocols they will follow, meaning which of the successor coins (one or both) investors will be trading when they transact on the exchange post hard fork
- Whether and when either the coins and tokens associated with the successor chains can be deposited and withdrawn from the exchange

These circumstances can result in significant market disorder as the actual asset being traded on different exchanges may vary even though they may intend to reference the “same” asset pair. This can be the case for exchanges that are constituent exchanges to benchmarks that are members of the CF Cryptocurrency Index Family.

When combinations of the above circumstances occur, it may not be clear whether the markets operated by spot exchanges that are utilised as input data sources continue to represent the same market reality as each other and hence the transactions and order books made available and utilised by the Administrator may represent the trading of different assets. Contentious hard forks are dynamic and fluid situations that occur in real time, 24/7. This means that consultation and approval from the Oversight Function may not be possible in the limited time available to ensure an orderly market for any financial contracts or instruments that reference the impacted benchmark.

Where the Administrator has visibility over a pending contentious hard fork it will consult the oversight function and deliver an analysis of the likely scenarios that the hard fork may produce and seek guidance as to the adequacy of this policy and the communication to the market on measures it may take.

Where the Administrator has limited visibility on the likely outcomes and impacts of any hard fork and where unfold too quickly to convene an oversight function meeting it will exercise its judgement to evaluate whether the integrity of the benchmarks is impacted to the degree that requires major changes to how the benchmark is determined. The Administrator will update the oversight function without undue delay when it takes any of the actions described in 4.7, 4.8, 4.9, 4.10 and 4.11 of this policy.

Guidance will be sought from the Oversight function on the whether there is a need for methodology change or benchmark cessation consultations.

4.6 Where Input Data no Longer Represents Market or Economic Reality that the Benchmark intends to measure

The Administrator will monitor several information sources to determine whether the input data continues to represent the market or economic reality that a benchmark is intended to measure. These shall include but not be limited to:

- The input data itself and the variances observed between input data sources
- Announcements and actions from different input data sources and their variance that pertain to:
 - The markets for trading of the cryptocurrency that underwent the hard fork
 - Establishment of markets for trading in tokens associated with the resultant blockchain
 - Policies regarding the crediting of any resultant tokens to holders of pre-fork balances of the original token
 - Availability of deposit and withdrawal functionality for the original token or resultant token(s).

In the process of monitoring the input data to determine whether it continues to be representative of the market or economic reality the benchmark intends to measure the Administrator will be exercising its discretion and judgement. This will be done with the utmost skill, care and attention. Where the Administrator determines that the input data is no longer representative the reasons for its decision will be clearly documented for review by the oversight function and the views of the oversight function will be reflected in this policy going forward.

4.7 Measures to be taken in the event of Input Data no Longer Representing the Market or Economic Reality the affected Benchmark(s) Seeks to Measure

In accordance with EU BMR Article 11 (4) once the Administrator has determined the input data is no longer representative of the economic reality that the benchmark seeks to measure then it shall immediately begin to identify means of remedying the situation in a very timely manner to ensure that benchmark users and market participants are not subjected to significant negative impact. In assessing remedial actions, it will follow a hierarchy of assessment:

- Assess the feasibility of utilising different input data from the same input data sources whilst ensuring that it adheres to the data hierarchy provisions of the Administrators Input Data Policy - Section 4- Types of Input Data- Data Hierarchy
- Assess the feasibility of utilising input data from different input data sources whilst ensuring that the it adheres to the input data source provisions of the Administrators Input Data Policy – Section 3 – Sources of Input Data
- Asses the feasibility of changing the methodology whilst ensuring that it continues to adhere to the below characteristics:
 - Robust & reliable

- Clearly identifies any elements of discretion
- Rigorous, continuous and capable of validation
- Resilient and can be calculated in the widest set of possible circumstances without compromising its integrity

4.8 Use of Different Input Data in determining the benchmark(s)

Where the Administrator utilises different input data to that which is stated in the publicly available methodology and documentation it shall make this known to index users through amended documentation where appropriate from the date of the change. Further to this both email notification and a prominent notice on the webpages that display the affected benchmark(s) will be sent and published. This notice will include the below information:

- Date from which the change in input data will take place
- The exact data that will cease to be used as input data
- The exact data that will begin to be used as input data
- Any changes to the methodology required to accommodate the new input data
- Any discretion that this change of input data will introduce into the process of determining the benchmark
- How this change of input data will positively impact benchmark integrity post the hard fork

4.9 Use of the same input data types from different input data sources

Where the Administrator utilises different input data sources to that which is stated in the publicly available methodology and documentation it shall make this known to index users through amended documentation where appropriate from the date of the change. Further to this both email notification and a prominent notice on the webpages that display the affected benchmark(s) will be sent and published. This notice will include the below information:

- Date from which the change in input data sources will take place
- The exact input data sources that will cease to be used
- The exact input data sources that will begin to be used
- Any changes to the methodology required to accommodate the new input data sources
- Any discretion that this change of input data source will introduce into the process of determining the benchmark
- How this change of input data source will positively impact benchmark integrity post the hard fork

4.10 Changes to the benchmark methodology

Where the Administrator seeks to change any part of the methodology from that which is stated in the publicly available methodology and documentation it shall make this known to index users through amended documentation where appropriate from the date of the change. Further to this both email

notification and a prominent notice on the webpages that display the affected benchmark(s) will be sent and published. This notice will include the below information:

- Date from which the change(s) in the methodology will take place
- The exact elements of the methodology that will undergo changes
- Any discretion that this methodology change will introduce into the process of determining the benchmark
- How this methodology change will positively impact benchmark integrity in light of the hard fork

4.11 Temporary suspension of affected Benchmark(s)

Where the Administrator has assessed potential changes to the input data, input data sources and methodology and concluded that they would be unlikely to resolve any issues faced by the benchmark in representing the market and economic reality the benchmark was intended to measure it shall consider a temporary suspension of the benchmark. Where the Administrator invokes a temporary suspension of the Benchmark it shall notify benchmark users and the market in advance as much as possible without unduly delaying the suspensions and compromising benchmark and market integrity. Any actions taken will also be clearly communicated to benchmark users and the market through email communication and statements published on the Administrators webpages

The Administrator will only resume publication of a suspended benchmark when it can confirm that the input data from the input data sources shows no ambiguity as to the economic reality that they represent and that this is consistent across the input data sources. Once the suspension has been lifted the Administrator will consult with the Oversight Function to decide if a methodology consultation would be appropriate and this will be conducted according to the Administrator's Methodology Consultation Process.

4.12 Cessation of Affected Benchmark(s)

Where the Administrator believes that it would be unlikely for the conditions required to lift the temporary suspension to be met in a reasonable timeframe then it shall initiative a review of the benchmark which could lead to a recommendation to the Oversight Function to initiate the necessary steps for the cessation of the affected benchmark(s).

5 Definitions

Day: Any time period from 00:00:00 to 23:59:59.

Input Data: Data used by the Administrator to determine the benchmark.

New Index: A reference rate or real-time index representing the price of the New Token vs. the base currency of the Original Index.

New Token: The token that is recognised as the new token by the Constituent Exchanges through the markets operated for the trading of the asset, utilising a new trading symbol for the asset that was not in use before the hard fork event

New Token Pair: A trading pair representing the price of the New Token vs. the price of the base currency of the Original Index.

Original Index: A reference rate or real-time index representing the price of the Original Token vs. a specific base currency.

Original Token: The token that is recognised as the original token by the Constituent Exchanges through the markets operated for the trading of the asset, utilising the same trading symbol for the asset as before the hard fork event

Original Token Pair: A trading pair representing the price of the Original Token vs. the price of the base currency of the Original Index.

Price: The volume-weighted average price of a token across all constituent exchanges on a given Day.

Trading Volume: The total combined notional trading volume in the respective base currency of a token across all constituent exchanges on a given Day.

Contact Information

CF Benchmarks Ltd

Address	Contact
CF Benchmarks Ltd 4 th Floor 25 Copthall Avenue London EC2R 7BP United Kingdom	Web: https://www.cfbenchmarks.com Phone: +44 20 7655 6085 Email: contact@cfbenchmarks.com

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