CF Digital Asset Index Family – Multi Asset Series

Ground Rules

Version:

3.4

Version Date:

06th February 2024

Table of Contents

Version History

Version	Date Issued	Summary of Change	Owner
1.0	19 Aug 2020	Launch	CF Benchmarks Management
1.1	28 Sep 2020	Addition of Assets to Appendix I • Chainlink • EOS • Stellar Lumens • Tezos	CF Benchmarks Management
2.0	26 Feb 2021	Expansion and Amendment of Provisions in: • Section 2 - Investible Universe • Section 3- Constituent Reviews • Section 4 – Constituent Weighting Addition of: • Appendix II – Constituent Custodial Services Providers	CF Benchmarks Management
2.1	28 Jun 2021	Amendments to the index calendar Addition of Assets to Appendix I • Cardano • Dogecoin • Ethereum Classic • Filecoin • Polkadot • Polygon • Solana • Uniswap	CF Benchmarks Management
2.2	25 Aug 2021	Expansion of Section 4 – Constituent Weighting Addition of clarifying clauses	CF Benchmarks Management
2.3	03 Sep 2021	Amendments to the treatment of distributions and deductions Addition of clarifying clauses	CF Benchmarks Management
2.4	21 Sep 2021	Addition of Sections • 2.3 - Asset Turnover • 3.3 - Sector & Thematic Indices Changes to Sections	CF Benchmarks Management

Version	Date Issued	Summary of Change	Owner
		• 4.5 – Alternative Weighting Methods • 7 – Reinvestment Procedure	
2.5	01 Feb 2022	Addition of Sections • General – replaced Cryptocurrency name with Digital Asset. • 3.4 Indices that select an undefined number of Digital Assets. • 4.5.2- Modified Market Capitalisation Weight. • 4.5.3- Diversified Market Captilisation Weight. Changes to Section • 3.3 Sector and Thematic Indices. • 3.5 Constituent Review • 4.2.1- Establishing Fungible Supply. • 4.5.3- Equal Weight and Modified Equal Weight.	CF Benchmarks Management
2.6	15 Feb 2022	Addition of Sections • 4.3.1.2.3 Treatment of deemed bridging accounts Changes to Section • Appendix I • Change to Custodian requirement	CF Benchmarks Management
2.7	20 Jul 2022	Section 2: Investible Universe: • Clarification of Eligibility Criteria • Increase in frequency of determination of Investible universe to quarterly • Specification of Liquidity and Turnover thresholds. Section 3: Constituent Review • Itemisation of review steps • Introduction of Relative Market Capitalisation Ratio	CF Benchmarks Management
2.8	09 Sep 2022	Introduction of UTXO Cut-off date in section 4.3.1.1. Updates to Sections 7, 8.	CF Benchmarks Management
2.9	17 Nov 2022	Change of name of Fungible Supply and Free-Float Supply.	CF Benchmarks Management

Version	Date Issued	Summary of Change	Owner
3.0	09 Feb 2023	Updated oversight function name from "CF Digital Asset Index" to "CF Cryptocurrency Index Family" Minor formatting changes applied across the document	CF Benchmarks Compliance Function
3.1	11 Sep 2023	Updated Section 4.2.1 by removing the following part "*half the period of one update of the free float market capitalisation calculation for each index constituent*". This statement was true when basked indices were rebalanced monthly, currently this process is undertaken quarterly.	CF Benchmarks Compliance Function
3.2	13 Nov 2023	Update to logo & format	CF Benchmarks Marketing
3.3	20 Nov 2023	Updated logo (AKC v2)	CF Benchmarks Marketing
3.4	06 Feb 2024	Addition of Appendix III – Expert Judgement Applied to the Calculation of the Dogecoin Free Float Supply	CF Benchmarks Compliance Function

1   Background to Digital Assets

1.1   Digital Assets

Digital Assets are decentralised assets supported by digital networks, operated through protocols established and governed by consensus that are implemented through computer software. Transactions in digital assets are validated and recorded through publicly available distributed ledgers, often utilising mechanisms known as Blockchains. All participants within the distributed ledger system are called nodes and the validation and recording of transactions is undertaken by nodes that satisfy the consensus mechanism that is established for the Digital Asset. Prominent types of consensus mechanisms include:

- "Proof of Work", the solving of cryptographic problems. The solving of cryptographic problems results in the establishment of a new block – a validated record that is added to the blockchain. Bitcoin is the most prominent Digital asset that utilises proof of work and most major Digital Assets such as Ether, Bitcoin Cash and Litecoin operate on a proof of work basis
- "Proof of Stake", a process of selecting a block validator through combinations of factors including; randomisation, age of node and wealth of node. EOS is a prominent example of a Digital asset that utilises proof of stake, and it has been proposed for Ether to move to proof of stake.
- "Proof of Correctness", a process of block validation where specific nodes exclusively take on the validation of transactions. XRP is a prominent example of proof of correctness.

The node that successfully adds new blocks to the chain is rewarded with units of Digital asset, this process is commonly referred to as mining. Digital Assets are stored in digital wallets tied to a public deposit address that is secured by encrypted private keys.

The first Digital asset, Bitcoin, was established in January 2009 by the release of open source code by a developer or group of developers under the pseudonym "Satoshi Nakamoto", and the first transaction recorded on the Bitcoin blockchain was on January 12th 2009. This software code was the digital implementation of a paper authored by Nakamoto in November 2008 entitled *"Bitcoin: A Peer-to-Peer Electronic Cash System".* Since that time Bitcoin has seen increasing adoption globally. The blockchain technology pioneered by the establishment of Bitcoin has paved the way for a number of other Digital Assets that share the key characteristics of Bitcoin in utilising a public distributed ledger of transactions verified by participating nodes. Prominent examples of other Digital Assets include Ether, Polkadot, Chainlink and Maker.

As Digital Assets operate through protocols governed by consensus, there can be situations where the consensus breaks down and a fork takes place where a new blockchain and ledger is established. Where the fork introduces a protocol that can be

reconciled with the protocols of the original blockchain and thus allow interoperability between the two, this is knows as a "soft fork". Soft forks are often temporary in nature and the blockchain maintains one sequential ledger of transactions. Where the fork introduces a protocol that cannot be reconciled with the protocols of the original blockchain thus meaning there is no interoperability between the two, this is known as a "hard fork". Hard forks usually result in two permanent blockchains where previously there was one and the creation of a new Digital asset. The prominent Digital Asset Bitcoin Cash is an example of Digital Assets that are the result of hard forks, in these cases from Bitcoin.

1.2   Digital Assets as an Asset Class

As Digital Assets cannot be easily classified within the existing asset class framework that is familiar to investors it is necessary to establish a new asset class for Digital Assets. To allow investors to track the performance, composition and evolution of the asset class a new series of benchmarks with rule sets and treatment appropriate to the asset class will be required.

2   The Investible Universe

To ensure that the benchmarks in the series can be investible and replicable without undue cost burdens and liquidity risks, eligible constituents are screened for their liquidity and ability to be stored in custody by third parties that have regulatory approval to provide services for the safe keeping of Digital Assets on behalf of investors. The resultant Digital Assets are deemed to be the investible universe of Digital Assets that are eligible for inclusion in the indices of the CF Digital Asset Index Family – Multi Asset Series ("**CF Multi Asset Index**"). The establishment and review procedure is described below. Eligible assets shall be documented in *Appendix I – Digital Asset Transaction Model Classification,* but an entry in an appendix does not indicate ongoing eligibility.

Note that a business day is defined as a day where banks are open in both the United Kingdom and the United States of America.

Digital assets that are pegged to the value of any asset, including but not limited to stablecoins, are not considered to be eligible. Digital assets shall also be excluded from the Investible Universe if there exist regulatory or legal actions that cast doubt as to whether the asset in question is indeed a Digital Asset.

2.1   Determination of the Investible Universe – Asset Safekeeping

The process for determining Digital Asset that can be stored with a third party provider of safe-keeping services takes place on the day after the 1st business day of March, June, September, December of each year and is known as the *"Custodial Requirement Determination Date"*

1. On the Custodial Requirement Determination Date the Administrator shall determine which Digital Assets each Constituent Custodial Services Provider (see *Appendix II – Constituent Custodial Services Provider*) publicly offers Digital asset safe-keeping services for on its website.

2. A Digital Asset will only be deemed to be eligible for inclusion into the Investible Universe if one or more Constituent Custodial Service Providers offer their services for the specific asset.

2.2   Determination of the Investible Universe – Liquidity

The process for liquidity screening is conducted by the Administrator on the 31st day following the 1st business day of June, September, December, and March each year. This day is known as the *"Liquidity Determination Date"*. For example, if the 1st business day in June is June 1st, the *Liquidity Determination Date* is July 2nd. All Digital Assets that meet the requirements from 2.1. are considered for the liquidity screening.

To be considered for inclusion in an index, a Digital Asset must be listed against the currency of denomination of the index on 2 or more Constituent Exchanges, where executions incur fees for market participants for the period since the 1st business day of June, September, December, or March, as is relevant for the Liquidity Determination Data.

1. For each Digital asset eligible for inclusion in any index the daily traded volume is calculated for the 30 previous days to the *Liquidity Determination Date.* For example, if the *Liquidity Determination Date* is July 2nd, the 30 days period starts at 00:00:00 UTC on June 2nd and ends at 23:59:59 UTC on July 1st. Only markets and trading pairs where a Digital Asset is listed as either the base asset or quote asset against the currency of denomination of the respective index will be included in the calculation.

2. The median daily traded value for the previous 30 days is then calculated to determine the Median Daily Traded Value of each Digital Asset.

3. All Digital Assets are then ranked by the Median Daily Traded Value, the highest first.

4. The Median Daily Traded Value for each Digital asset is then divided by the Median Daily Traded Value of the Digital Asset ranked first in the previous step. The resultant value is the *Relative Liquidity Ratio* of each Digital Asset.

5. Only Digital Assets with a Relative Liquidity Ratio of 0.01% or higher shall be considered to be part of the Investible Universe.

2.3 Determination of the Investible Universe – Asset Turnover

The high price volatility exhibited by Digital Assets and the nascent nature of the asset class mean that it is necessary to also consider whether significant stakes in any given Digital asset can be built by investors, without undue risk exposure. The Relative Liquidity Ratio determination ensures that only Digital Assets that are actively traded are eligible for index inclusion. Supplementary to this it is also imperative that only Digital Assets that have a significant proportion of their fungible supply traded on Constituent Exchanges are to be considered for inclusion. This ensures that not only can investors obtain liquidity in any potential index constituents but also ensure that significant stakes can be built and held without undue risks and costs. This process is known as "*Asset Turnover Screening*".

The purpose of Asset Turnover Screening is to ensure that a sufficient percentage of total supply is readily available for trading to enable effective replication of the index whilst not exposing investors to undue risks.

The process of Asset Turnover Screening shall be conducted by the Administrator on the 31st day following the 1st business day of March, June, September, and December of each

year which is the "*Asset Turnover Determination Date*". All Digital Assets that meet the requirements of Asset Safekeeping and Liquidity above, shall be considered for Asset Turnover Screening.

1. The total number of a given digital asset traded on Constituent Exchanges during the month of March, June, September, and December ("**Turnover Determination Months**") shall be divided by the prevailing total supply to determine a ratio for each asset ("**Turnover Ratio**").

2. For an asset to be eligible for inclusion in the Investible Universe, its Turnover Ratio shall be equal to or greater than 0.05%.

3 Constituent Review

3.1 General

CF Multi Asset Indices that have defined Digital Asset constituents will not undergo a constituent review process.

CF Multi Asset Indices that require a Constituent Review will undergo a Constituent Review on a quarterly basis, the Reconstitution of the index shall take place on the 1st business day of March, June, September, and December.

The Constituent Review Date is defined as the 1st business day of February, May, August, and October.

3.2 Indices that select a fixed number of undefined Digital Asset Constituents based on full market capitalisation rank

CF Multi Asset Indices that select a fixed number of index constituents based on full market capitalisation rank will undergo a Constituent Review based on the timeline described in Section 3.1 above. On the *Constituent Review Date*:

- All Digital Assets that exhibit a *Relative Liquidity Ratio* above the *Minimum Liquidity Requirement* for the index on the previous *Liquidity Determination Date* (see Section 2.2) are selected or retained provided that:
    - An existing index constituent exhibits a *Liquidity Ratio* that is within 80% of the *Minimum Liquidity Requirement*
    - A Digital asset that is not an existing index constituent exhibits a *Minimum Liquidity Requirement* that is 120% of the *Minimum Liquidity Requirement*

- For each Digital Asset selected in the above step the *Full Market Capitalisation* is calculated as described in Section 4.2, where the price is given by the median price over the 30 days following the 1st business day in June and December (values at 23:59:59 UTC) and the total available supply is given on the 6th business day (values at 16:00:00 UTC) prior to the 1st business day in July and January.

- The Digital Assets selected to be included as index constituents at the *Constituent Review Date* shall be:
    - The first Digital Asset ranked by its *Full Market Capitalisation*
    - All subsequent Digital Assets ranked by *Full Market Capitalisation* (largest first) until the *n*th Digital Asset (where *n = the fixed number of index constituents* in the case of an index with a fixed number of constituents)

- To avoid unnecessary turnover in index constituents each index will employ index *Constituent Review Buffers* at each Constituent Review that will be defined in the respective index methodology.

3.3 Sector and Thematic Indices – Where Constituents are Selected based on Metadata

CF Multi Asset Indices that select constituents based on metadata pertaining to the "sector" or "theme" that the Digital asset fulfils will undergo a Constituent Review Process based on the timeline described in Section 3.1 above. On the *Constituent Review Date*:

- All Digital Assets that meet the Investible Universe requirements in Section 2 above

- All Digital Assets within the Investible Universe shall be screened for the Full Market Capitalization Requirement as set out in the Index Parameter Table and calculated as per Section 4.2 below and:
  - All Digital Assets shall be ranked by their Full Market Capitalization.
  - Each Digital Asset's Full Market Capitalization shall be divided by the Full Market Capitalization of the digital asset ranked highest in the previous step.
  - The resulting value is the asset's Relative Market Capitalisation ratio.

- Digital Assets must meet the Minimum Liquidity Ratio stated in the respective index methodologies and calculated in accordance with the steps described in Section 2.2 above.

- Digital Assets must meet the Minimum Turnover Ratio stated in the respective index methodologies and calculated in accordance with the steps described in Section 2.3 above.

- The most current snapshot of the metadata source will be taken.

- The metadata will be interrogated in accordance with the parameters defined within the respective index methodology and where applicable.

- To avoid unnecessary turnover in index constituents each index may employ index *Constituent Review Buffers* for Full Market Cap, Liquidity, and Asset Turnover at each Constituent Review that are defined in the respective index methodology.

3.4 Indices that select an undefined number of Digital Assets – Where Constituents are selected based on their inclusion in the (n)th Percentile of the Full Market Capitalization of the Investible Universe.

CF Multi Asset Indices that select constituents based on the Full Market Capitalization of the CFB Investible Universe of assets. The index will undergo a Constituent Review Process based on the timeline described in Section 3.1 above. On the *Constituent Review Date*:

- All Digital Assets that meet the Investible Universe requirements in Section 2 above.

- All Digital Assets within the Investible Universe shall be screened for the Full Market Capitalization Requirement as set out in the Index Parameter Table and calculated as per Section 4.2 below.
  - All Digital Assets shall be ranked by their Full Market Capitalization.
  - Each Digital Asset's Full Market Capitalization shall be divided by the Full Market Capitalization of the digital asset ranked highest in the previous step.
  - The resulting value is the asset's Full Market Capitalization Ratio.

- Digital Assets must meet the Minimum Liquidity Ratio stated in the respective index methodologies and calculated in accordance with the steps described in Section 2.2 above.

- Digital Assets must meet the Minimum Turnover Ratio stated in the respective index methodologies and calculated in accordance with the steps descried in Section 2.3 above.

- The Total Full Market Capitalization is calculated for the CF Benchmarks Investible Universe as defined in Section 2; a summation of all Full Market Capitalization for all Digital Assets where a CF Benchmarks Reference Rate exists.

- All Digital Assets whose market capitalisation begins within the (n)th percentile, as defined in the index methodology, of the Total Full Market Capitalization of all Digital Assets in descending rank order are selected for inclusion in the Index.

- To avoid unnecessary turnover in index constituents each index may employ index *Constituent Review Buffers* for Full Market Cap, Liquidity, and Asset Turnover at each Constituent Review that are defined in the respective index methodology.

3.5 Constituent Review Implementation

The results of the Constituent Review process shall be implemented at the next Rebalance Day for each index as stipulated in their respective methodologies.

3.6 Exceptional Constituent Reviews

There may be circumstances that mean existing index constituents shall need to be removed from an index within the *CF Digital Asset Index Family - Multi Asset Series.* This could be due to a variety of circumstances:

- Regulatory or legal actions that cast doubt as to whether the asset in question is indeed a Digital Asset.
- The determination of price becomes impossible due to markets for the trading of the Digital Asset being suspended on Constituent Exchanges due to security, operational or legal concerns.

In these circumstances the Administrator shall conduct an Exceptional Constituent Review on an Exceptional Constituent Review Date that shall be the 7th day immediately preceding the day that an existing index constituent is removed from the index. The Exceptional Constituent Review shall follow the same process as the Constituent Review process as described in Sections 3.1 to determine the Digital asset that will replace the removed index constituent.

3.6.1 Exceptional Constituent Review Implementation

An Exceptional Constituent Review shall be implemented on the day that an existing index constituent is removed from an index. In implementing an Exceptional Constituent Review the index is rebalanced regardless of whether the implementation day is itself a Rebalance Day. The index will then undergo rebalancing on subsequent Rebalance Days as described in *Section 6 - Rebalance Procedure*.

4 Constituent Weighting

The Administrator's Multi Asset Indices will utilise a variety of mechanisms for the weighting of index constituents. For the purposes of measuring market beta index constituents will have their portfolio weights determined by market capitalisation and this can be in the form of full market capitalisation or free float market capitalisation.

4.1 Using Free Float Market Capitalisation versus Full Market Capitalisation for weighting of constituents

There are numerous benefits of utilising free float market capitalisation as opposed to full market capitalisation for the purposes of weighting constituents in a capitalisation weighted index. Foremost of these is that a free float market capitalisation weighting of constituent assets is more representative of the behaviour of market participants. The price formation is more representative of the supply-demand dynamics for that asset. A free float capitalisation weighting of constituents will also allow the index to be replicated more efficiently as it minimises the risks of investors being compelled to accumulate assets that are not available to be bought on the open market and hence creating price distortions in the asset.

4.2 Calculating Full Market Capitalisation for Digital Assets

The market capitalisation of an asset in traditional assets is widely understood and is generally represented by the below formula:

*Total Available Supply * Prevailing Price = Market Capitalisation*

The purpose of market capitalisation is to give investors a view on the prevailing cumulative value represented by all of the outstanding securities of a particular issue or combination of issues. For traditional assets the total available supply represents all of the units of the security that are *available to be exchanged*. Though the number can of course change through buybacks, stock dividends, secondary offerings and other corporate actions it still represents the total amount of a security that is *available to be exchanged*. The key aspect of the market capitalisation calculation is that all of the *Total Available Supply* is fungible.

For Digital Assets, there are a number of aspects that can mean the *Total Available Supply* is not the same as the *total available to be exchanged or spent*. This varies between different Digital Assets depending on; the original design philosophy, the manner in which the network the asset is native to has evolved and the operating protocols of the prevailing popular node implementations. We will refer to this as the *Fungible Supply* (and this value may change over time).

So in calculating a "market capitalisation" for Digital Assets a more accurate reflection of this value is:

Fungible Supply * Prevailing Price = Full Market Capitalisation

4.2.1 Establishing Fungible Supply

Fungible Supply is defined as the total units of any Digital Asset that *can move from one deposit address to another deposit address* of the network to which it is native. There are a number of reasons that some specific units of a Digital Asset cannot be moved from one deposit address to another and hence why the total available supply can differ from the fungible supply, these include but are not limited to:

- By design for certain units – such as "genesis" units

- User error that results in units that cannot be transferred between deposit addresses

- Consensus rule changes that result in incompatibility with prevailing node implementations

- Coins that are delegated/staked/bonded and cannot be moved for a certain period

It is important to note that not all the reasons why a specific unit or units of a digital asset are not fungible will be immutable. If by design the movement restriction can be lifted by the holder after a certain period, Digital Assets that can be unencumbered in less than or equal to 14 UTC days shall be considered fungible. In some cases changes to consensus rules may change the fungibility of specific units of a digital asset. This will be taken into account in the methodology steps describing the fungible supply updating process.

Whereas an asset exists on multiple chains and is fungible between them, the native chain shall be taken as the first chain that satisfies:

1. The chain which is supported by the most Constituent Exchanges for deposits or withdrawals to said chain across all candidate chains

2. Whereas multiple candidate chains have equal number of exchanges satisfying condition 1, the chain whose supporting exchanges have the highest *Relative Liquidity Ratio* across all candidate chains

3. By the administrator's expert judgement of where most of the liquidity is across all candidate chains

Such a determination of the native chain of the digital asset shall be made at the asset's entry to the Investible Universe and whenever the administrator applies expert judgement regarding the liquidity of the asset on its candidate chain. The native chain of an asset shall be documented in *Appendix I – Digital Asset Transaction Model Classification*.

4.3 Calculating Free Float Market Capitalisation

Capitalisation weighted indices in the equity asset class are now usually calculated using free float market capitalisation instead of full market capitalisation. Free Float Market Capitalisation differs from Full Market Capitalisation in that instead of Total Available Supply it is Free-Float Supply that is multiplied by Prevailing Price:

*Free-Float Supply * Prevailing Price = Free Float Market Capitalisation*

4.3.1 Establishing Free-Float Supply

Establishing the *Free-Float Supply* in Digital Asset and Digital Asset markets is a much more nuanced task than in traditional securities. In traditional securities, shareholder registers are available and can be searched to establish the proportion of securities that might not be readily available for trading on the open market (and by deduction, one can work out what is available). For Digital Assets no such register of ownership exists due to the bearer nature of Digital Assets. The problem of significant proportions of the supply outstanding not being readily available for trading is very much in existence in Digital Asset.

Some prominent phenomena include:

- Long term strategic holders; often but not always tied to the founding teams

- "Locked" or "escrowed" Digital Asset, whose operation is often but not always described in the underlying project white paper

- Lost keys: Digital Assets are bearer assets, once a private key is lost then access to those Digital Asset units is lost as well

- Inaccessible keys: Digital Assets are bearer assets, where the keys are stored in hardware devices that have become inaccessible

- Stolen keys: where private keys have been stolen and are likely closely monitored and are not likely to be moved

To consider ways that can allow us to potentially exclude such coins we must also consider the fact that Digital Asset networks are built on differing architectures and transaction models so any approach to this will have to take into this into account.

In general, we can divide Digital Asset network transaction models into two types; those that are centred around Digital Asset units themselves (*coin-centric*) such as Bitcoin, Litecoin, Bitcoin Cash and those that are centred around accounts (*account-centric*) in which the Digital Asset is held such as Ethereum and Ripple XRP. For avoidance of doubt all coins under consideration in this section must be deemed fungible under Section 4.2.1.

4.3.1.1   Digital Assets that are coin-centric

Coin-centric Digital Assets are native to networks that generate UTXO outputs each time a coin is "spent" - moved from one deposit address to another deposit address. Therefore, it is possible to interrogate the network of a coin-centric Digital Asset to ascertain which coins have been "spent" within a certain timeframe. It can therefore, be inferred that coins that have not been spent for a prolonged period of time are likely not available for trading. Reasons could include:

- Coins residing in wallets where the private keys have been lost/stolen/become inaccessible

- Coins held for long term strategic investment

This being the case we can use the record of UTXO outputs for coin-centric Digital Assets as a test for whether any units of Digital Assets are *Free-Float Supply*. Although any period of time that is determined as the start date for the measurement of UTXO outputs as an approximation for the phenomenon we seek to capture is arbitrary, the price action exhibited by Digital Assets can serve as a good guide as to what time period would be most appropriate, especially in regard to lost coins. Given the price history that Digital Assets have exhibited it would be reasonable to assume that coins that have not generated an UTXO output in the 7 years preceding the 1st calendar day of the month during which the supply calculation is being conducted. (the "UTXO Cut-off Date") is very likely due to private keys being lost or relates to coins that are held for a long-term strategic investment. However, given this is an approximation by date based on price history this date shall need to be revised in the future. If the Digital Asset is the result of a hard fork (see Section 7) the UTXO generation cut-off time shall be the later of the UTXO Cut-off Date and the fork point.

4.3.1.2   Digital Assets that are account centric, applying a discount factor

Account-centric Digital Assets are native to networks that centre the messaging of that network around the accounts that are native to that network as opposed to units of the Digital Asset. Prominent examples include Ethereum and the Ripple Ledger for the Ripple XRP token. As the "spending" movements of specific tokens is not the primary format of the ledger, applying the same test as that which we apply to Digital Assets native to coin-centric networks would necessarily be an approximation and difficult to replicate and validate. In its stead we can attempt to establish accounts that are likely to be long term holders, often founders or non-profit organisations closely tied to the founders of the network. Hence this Digital Asset is *not likely to be available for trading* and its inclusion would have a material impact on the free float calculation.

The simplest way to calculate this is to take all the accounts of an account centric Digital Asset network and determine the amounts of Digital Asset contained in each through querying the network. Where any single account contains more than a specific

percentage of the Fungible Supply then a discount factor is applied to that amount. This approach assumes that a portion of the Digital Asset in that account is being held for long term strategic reasons with the remainder being *the Free-Float Supply.*

The discount factors applied to account centric Digital asset accounts are determined to be:

Amount Held in a Single Account	Discount Factor
>=2.5% of the Total Available Supply	100%
>=1.0% of the Total Available Supply	80%
>=0.5% of the Total Available Supply	60%
>=0.2% of the Total Available Supply	40%
>=0.1% of the Total Available Supply	20%

4.3.1.2.1 Exempting service provider accounts from discounting

By applying the above discount factors, we would capture both Digital Asset that is held by long term strategic holders and Digital Asset that resides in "aggregated" accounts. These are accounts where the Digital Asset is held on behalf of their owners by service providers. Prevalent examples of this would include:

- Digital Asset exchanges – where the account balance substantially represents the balances of its clients
- DeFi Protocols - smart contracts where Digital Asset is "locked" and represents the cumulative balance of its users

Although the identity of account controllers is not available on the Digital Asset networks themselves there are a number of vendors of blockchain analytics data that can identify some of the more prominent service providers. Furthermore, the Administrator applies deposit and withdrawal threshold metrics to determine the nature of the accounts and whether they are likely to be accounts associated with the above services and whether the tokens held by them be considered as *Free-Float Supply* and thus exempt from discounting.

4.3.1.2.2 Alternative discounting without account classification

If classifications cannot be obtained for a certain Digital Asset such that it cannot be determined which accounts are exempt from discounting under section 4.3.1.2.1, the following discounting scheme shall apply:

1. Calculate the ratio between the Free-Float Supply and the Fungible Supply for each Digital Asset in the index that is not subject to the provisions of this section

2. Calculate the median of the ratios
3. The **Free-Float Supply** shall be the median ratio times the fungible supply of that Digital Asset

If no median can be obtained at step 2, such as if all Digital Assets of an index do not have classifications obtainable for them, then no exempting from discounting shall apply for all such Digital Assets.

4.3.1.2.3   Treatment of deemed bridging accounts

If an account-centric Digital Asset is fungible among multiple chains or representations, the assets on a different chain or in a different representation are often, but not always, represented as a single account on the native chain. In this case the Administrator shall replace the single account on the native chain with the individual accounts on the different chain or representation when applying the discounting rules in the section 4.3.1.2.

This section shall apply if all the following conditions are held:

4. That one and only one account on the native chain contains more than 50% of the fungible supply of the asset (the *Majority Account*)

5. That the Administrator can determine that the *Majority Account* represents the collective balances of all accounts in the *Alternative Account List* (as defined below) on a different chain or representation (the *Alternative Representation*)

6. That the Administrator can identify all individual balances and their associated accounts in the *Alternative Representation*

7. That the Administrator can identify service provider accounts (defined in the section 4.3.1.2.1) among the accounts in the *Alternative Representation*

Whereas all above conditions are upheld, the Administrator shall take the following steps:

1. If an account in the *Alternative Representation* represents the collective balance of all accounts (excluding the *Majority Account* defined in condition 1) on the native chain, this account is deemed the *Alternative Bridge*. If the *Alternative Bridge* exists, the *Alternative Account List* shall consist of all accounts in the *Alternative Representation* excluding the *Alternative Bridge*. If the *Alternative Bridge* does not exist, the *Alternative Account List* shall consist of all accounts in the *Alternative Representation*.

2. When the Administrator applies the rules in the section 4.3.1.2, the *Majority Account* shall be replaced by all accounts in the *Alternative Account List*, when applying the discounting rules.

4.4 Mitigating against large swings in Free-Float Supply

Digital Asset networks are inherently scalable in terms of the number of users that can utilise them. The number of deposit addresses or accounts is unlimited. There are also techniques available that allow holders of Digital Asset to distribute their holdings across a wide range of deposit addresses and accounts. Although this technique is available to all holders of Digital Asset it is not very commonly practiced as it adds to the complexity of key storage – each address creates a new key that needs to be stored securely. Nevertheless to mitigate against large swings in the *Free-Float Supply* and hence the weight of constituents within any index caused by fluctuations in this value it would be prudent to apply a limit to the degree of change to Free Float Supply between each rebalance. This is known as the *Monthly Change in Free Float Supply* and is capped at 5%.

4.5 Alternative Constituent Weighting Methods

It is anticipated that the CF Multi Asset Index Series shall have within it a series of indices with different constituent weighting methods. These ground rules shall be updated to include details of these different constituent weighting methods as they become available.

4.5.1 Modified Market Capitalisation Weight

Where an index is designed to track specific sectors or phenomenon within the Digital Asset universe the index may be divided into specific sub-portfolios. The constituents within such sub- portfolios may be weighted by free float market capitalisation but each sub-portfolio may have a specified weight within the index regardless of the number of constituents within the sub-portfolio and their respective market capitalisations. In these cases, whilst the constituents of any sub portfolio are free float market capitalisation weighted the weights of constituents within the Index overall are thus weighted to a *modified market capitalisation weight.*

Where index constituents or subsets of index constituents are to be weighted to *modified market capitalisation weight* these shall be applied:

- At rebalance points
- To both Real Time and End of Day variants simultaneously

4.5.2 Diversified Market Capitalisation Weight

Due to the significant disparity in market capitalisation between the very largest Digital Assets and the rest of the asset class when measured by it can often be the case that a free float market capitalisation weighted index results in a portfolio that is highly concentrated. To fulfil investors' needs for diversification it may be necessary to apply

modifications to free float market capitalisation weights. In traditional asset classes such market phenomenon are often dealt with by the means of applying weighting caps. Due to the nascent nature of the asset class and the relatively small number of investible assets the application of caps, where excess weight is re-invested through the divisor, can result in a portfolio where constituent weightings become too divorced from market "beta".

To promote diversification and track market beta constituent weights of the Index portfolio, or sub-portfolios where applicable, constituents will be weighted by Diversified Market Capitalisation which shall be applied through the following method:

- For each eligible asset, the Free-Float Market Capitalization, after adjustment as per below, forms the basis of the weighting calculation within the index.

- Each eligible asset's Free-Float Market Cap shall be modified such that each additional increment of market cap (the "*Increment Parameter*") within the index market capitalization is discounted increasingly using an inverse step function. The first increment is not discounted, the next increment is divided by 2, and the next is divided by 3, etc.

Where index constituents or subsets of index constituents are to be weighted to *diversified market capitalisation weight* these shall be applied:

● At rebalance points

● To both Real Time and End of Day variants simultaneously

4.5.3 Equal Weighting and Modified Equal Weighting

Due to the nascent nature and the volatility exhibited by the Digital Asset class there may be times when Index aims are be best fulfilled by weighting constituents, or a subset of constituents equally. For example, where an index is designed to track specific sectors or phenomenon within the Digital Asset universe the index may be divided into specific sub-portfolios. The constituents within such sub-portfolios may be weighted equally but each sub-portfolio may have a specified weight within the Index regardless of the number of constituents within the sub-portfolio or their respective market capitalisations. In these cases, whilst the constituents of any sub portfolio are equally weighted the weights of constituents within the Index overall are weighted to a *modified equal weight*.

Where index constituents or subsets of index constituents are to be weighted equally or to modified equal weight these shall be applied:

● At rebalance points

● To both Real Time and End of Day variants simultaneously

4.6 Capping of Constituent Weights

To facilitate the replication of the Indices within the CF Multi Asset Index Series by product providers that wish to satisfy certain regulatory requirements, such as those applicable to UCITS funds In the European Union, index variants will be offered that cap the weights of constituents. Indices may be offered utilising a number of different capping mechanisms. In all cases where weight capping of index comes into effect this will be applied to all index variants.

4.6.1 Fixed Frequency Weight Capping

Where an index employs a fixed frequency of weighting cap of constituents, this will be undertaken at rebalance points. In all cases the weight caps will be applied to both the Real Time and End of Day variants of any index simultaneously.

4.6.2 Dynamic Frequency Weight Capping

Where an index employs a dynamic frequency of weighting cap of constituent, this will necessitate "emergency rebalances". In all cases constituent weights will be observed for the once-a-day variant of the Index to determine whether the weighting threshold has been breached and an emergency rebalance Is required. In all cases the weight caps will be applied to both the Real Time and End of Day variants of any index simultaneously.

5   Constituent Pricing Sources

Due to the distributed nature of Digital Asset trading for each Digital Asset that is a constituent of a CF Multi Asset Index, a pricing source must be determined for utilisation as input data to the index. The index methodology shall include the pricing source for each index constituent, and this shall be reviewed at each rebalance point by the Administrator. Should any constituent pricing source change then the index methodology shall be updated to reflect the change. In general, the constituent pricing sources utilised will follow the below input data hierarchy.

5.1   Input Data Hierarchy

The Administrator provides price benchmarks for several Digital Assets against a variety of quote assets. The hierarchy of input data sources for any Digital Asset that is a constituent of the indices shall, in order, be the below with each subsequent source replacing the previous where the previous becomes permanently unavailable:

1. The Administrator's price benchmarks for a Digital Asset in the same quote currency and publication frequency as the index

2. The Administrator's price benchmarks for a Digital Asset in a different quote currency but same publication frequency as the index shall be translated to the index quote currency using a suitably robust fiat currency to fiat currency FX rate

3. The Administrator's price benchmarks for a Digital Asset in a different Digital Asset quote currency but same publication frequency as the index shall be translated to the index quote currency using an available price benchmark

6 Rebalance Procedure

CF Multi Digital asset Indices shall be rebalanced on a periodic basis, the exact frequency will depend upon the individual index in question. The rebalance procedure shall be comprised of the following steps regardless of the rebalance frequency.

6.1 Establishing Index Constituents

At the *Rebalance Implementation Point* the index constituents will be rebalanced based on the latest data available at the *Rebalance Determination Date*.

6.2 Establishing in scope blockchain and ledger records

At the Index *Rebalance Determination Point* the Administrator will establish the block height or ledger number of each Digital Asset that is an index constituent. This is done by observing the latest block or ledger that has received sufficient confirmations to be unambiguously the latest block or ledger at the *Rebalance Determination Point* in the dominant chain thus deemed to be permanently irreversible. This shall be known as the *Rebalance Block Height* or *Rebalance Ledger Number*.

6.3 Querying blocks or ledgers to establish Fungible Supply and Free-Float Supply

Once the *Rebalance Block Height* or *Rebalance Ledger Number* is established for each index constituent then the Administrator shall query the respective blockchain or ledger to establish both the *Fungible Supply* and the *Free-Float Supply* where these amounts will affect the weights of the index.

6.3.1 Index Constituents: Coin Centric Networks

UTXO outputs generated by network transactions will be queried for each network of a coin centric index constituent. All coins that have generated an UTXO output since the UTXO generation cut-off time as defined in section 4.3.1.1 shall be summed to generate the *Free-Float Supply* for the rebalance month. If there are any Digital asset units to be added to the *Free-Float Supply* from the previous month due to the **Monthly Change in** *Free-Float Supply* Cap being met in those months then these shall be added to the *Free-Float Supply* number determined for the rebalance month.

Should the **Change in** *Free-Float Supply* meet 5% then the remaining Digital Asset units will be added to the sum for *Free-Float Supply* at the rebalance procedure for the following rebalance up to a maximum of 5% with the remainder carried to the next rebalance and repeated for subsequent rebalances until all the Digital Asset units are reflected In the *Free-Float Supply*.

6.3.2 Index Constituents: Account Centric Networks

All accounts active on the network will be queried for each network of an account centric index constituent. The total sum of fungible Digital Asset units residing in each account will be computed as a percentage of the Fungible Supply. Where any of the accounts show a total amount of Digital Asset that crosses the threshold of the Amount Held in a Single Account in the below table will be identified. A blockchain analytics provider will be utilised to then identify whether any of the accounts showing balances in excess of the Amount Held in a Single Account are controlled by firm types exempt from discounting as defined in 4.3.1.2.1. These accounts will have their balances be included in the *Free-Float Supply*. The corresponding Discount Factor will be applied to all accounts identified that are not exempt from discounting and have their discounted balances summed to generate the *Discounted Amount* for that rebalance.

Amount Held in a Single Account	Discount Factor
>=2.5% of the Fungible Supply	100%
>=1.0% of the Fungible Supply	80%
>=0.5% of the Fungible Supply	60%
>=0.2% of the Fungible Supply	40%
>=0.1% of the Fungible Supply	20%

The Free-Float Supply = The Fungible Supply – Sum of Discounted Amounts for the rebalance period

6.4 Determination of Constituent Supplies for Rebalance

The *Fungible Supply or Free-Float Supply* for each index constituent shall be determined.

6.5 Rebalance Implementation

At the *Rebalance Implementation Point* the Administrator shall rebalance the index constituent weights using the Constituent Supplies that have been determined in 6.4.

7   Reinvestment Procedure

CF Multi Asset Indices shall apply its return amount on a periodic basis, the exact frequency will depend upon the individual index in question. The reinvestment procedure shall be comprised of the following steps regardless of the reinvestment frequency.

7.1   Reinvestment Window

The reinvestment window is the window when the *Return Amount* is determined and reinvested into the index. The window starts on the day of the *Reinvestment Determination Point* (section 7.2) and ends on the day of the *Reinvestment Implementation Point* (section 7.3). A Distribution Event or Deduction Event ("*Event*") is deemed applicable to a window if the Event happened at least one working day prior to the first day of the window, otherwise the Event shall be applicable to the next reinvestment window.

7.2   Establishing Reinvestment Amount

The amount to be reinvested ("*Return Amount*") shall be determined at the *Reinvestment Determination Point*. The Return Amount shall be either the Distribution Proceeds or the Deduction Amounts from the applicable Event (as defined in 7.1) of that reinvestment window. The *Reinvestment Determination Point* shall be the next working day after the Event unless specified otherwise in the specific index.

7.3   Reinvestment Implementation

The Return Amount shall be reinvested into the index at the *Reinvestment Implementation Point*. The *Reinvestment Implementation Point* shall be the next working day after the applicable Event (as defined in 7.1) unless specified otherwise in the specific index. Where the Reinvestment Implementation Point coincides with a Rebalance Implementation Point the reinvestment shall be made through the post-rebalance divisor.

8   Treatment of Distributions

CF Benchmarks provides Multi Digital asset indices in either Price or Total Return. In scenarios of distributions the calculation rules will vary for the two different return variants.

8.1   Price Return Variants

Price Return index variants will not incorporate any distributions to their calculation.

8.2   Total Return Variants

Total Return index variants will incorporate distributions at the *Reinvestment Implementation Point* by re-investing the *Distribution Proceeds* into the index constituents proportionate to the weights that are established at the *Reinvestment Implementation Point*.

8.3   Distribution Scenarios for Digital asset holders

There are several scenarios that holders of a Digital asset can be entitled to distributions.

8.3.1 Fork Events

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.

8.3.2 Soft Forks

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" do not result in major disruptions to the network. These events do not produce distributions for Digital Asset and Digital Asset holders and hence do not affect the calculation of indices.

8.3.3 Hard Forks

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 cause a hard fork to occur and may result in the creation of a new blockchain and associated new token.

In this scenario a hard fork is deemed to have occurred to an index constituent if:

1. two or more divergent blockchains are in existence post-fork that share the same pre-fork blockchain that underlie the index constituent,

2. the Digital Assets 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.

When a hard fork event occurs to an existing index constituent and a new Digital Asset is created, holders of the original Digital Asset will be entitled to "claim" the resultant Digital Asset on a one for one, unit basis (against the original Digital Asset). The resultant new token will be considered as a distribution to the original Digital Asset and a *Distribution Event* is deemed to have occurred if it satisfies the below conditions:

1. Immediately after the hard fork event:

   - The new Digital Asset is immediately fungible with no impediments whatsoever

   - The manner of the hard fork results in the private keys associated with the account/UTXO containing that constituent Digital Asset to be the only requirement to claim the new Digital Asset

   - There is a one-to-one correspondence between the fungible original Digital Asset and the fungible new Digital Asset

2. On the 7th working day after the hard fork event:

   - The new blockchain continues to be actively mined

   - Two or more Constituent Exchanges ("*Qualifying Exchanges*") utilised by the Administrator list the resultant token for trading against the base currency of the CF Multi Asset Index to which the constituent Digital Asset is a member in the preceding 3 working days

   - The total trading volume observed for the resultant token conducted on Constituent Exchanges utilised by the Administrator in the preceding 3 working days is greater than or equal to 5% of the trading volume observed for the constituent Digital Asset across all Constituent Exchanges

For avoidance of doubt the *Distribution Event* is deemed to have happened on the day all above conditions are satisfied.

8.3.4 Airdrops

Another form of potential distribution for Digital Asset holders comes in the form of "airdrops". Airdrops are situations where existing holders of a Digital Asset, often founders or network foundations, distribute Digital Asset units to holders of another Digital Asset. This is often undertaken to stimulate adoption of the Digital Asset being distributed, as the "target" Digital Asset is usually more widely held and utilised than the Digital Asset being distributed.

Where any index constituent becomes the "target" of an airdrop i.e. a token not native to that blockchain is distributed to holders of the Digital Asset then this shall be considered a *Distribution Event* to the constituent digital asset if it satisfies the below conditions:

4. Where the Digital Asset that is airdropped is an index constituent Digital Asset and immediately after the airdrop event:

    - The distributed Digital Asset is immediately fungible with no impediments whatsoever

    - The airdrop must not be conditioned on the holder taking any action either on-chain or off-chain. This includes but is not limited to: placing a movement restriction on any proportion of funds, sending a transaction or message (whether the transaction or message involves funds or not), registering the account or funds for distribution, or running a node.

    - The distributed amount to each holder must be reasonably calculated and be the same of any user holding the same amount of digital asset. This means that two users who hold the same total amount of fungible digital asset in any configuration of accounts/UTXOs must receive the same amount of distributed digital asset. Such two users can be actual or hypothetical users.

    - If the amounts used to calculate the distributed amounts are not taken instantaneously at the airdrop event, i.e. a 'snapshot' is taken prior, the amounts used must be no older than 30 UTC days prior to the airdrop event.

    - The manner of the airdrop results in the private keys associated with the constituent digital asset to be the only requirement to claim the distributed tokens

5. If the airdropped token is not a constituent Digital Asset at the time of the airdrop event and immediately after the airdrop event, in addition to fulfilling the conditions above, it must also fulfil:

    - The blockchain underpinning the Digital Asset being airdropped continues to be actively mined

- Two or more Constituent Exchanges ("**Qualifying Exchanges**") utilised by the Administrator list the resultant token for trading against the base currency of the CF Multi Asset Index to which the constituent Digital Asset is a member in the preceding 3 working days

- The total trading volume observed for the airdropped Digital Asset conducted on Constituent Exchanges utilised by the Administrator in the preceding 3 working days is greater than or equal to 5% of the trading volume observed for the constituent Digital Asset across all Constituent Exchanges

For the avoidance of doubt the **Distribution Event** is deemed to have happened on the day all the above conditions are satisfied.

8.3.5 Other rewards

Some Digital Assets may also distribute some amount of the same Digital Asset to each account/UTXO holder. Where any index constituent has such funds distributed to holders of the Digital Asset then this shall be considered a **Distribution Event** to the constituent Digital Asset if it satisfies all the below conditions immediately after the distribution:

- The distributed amount is immediately fungible with no impediments whatsoever.

- The distribution must not be conditioned on the holder taking any action either on-chain or off-chain. This includes but is not limited to: placing a movement restriction on any proportion of funds, sending a transaction or message (whether the transaction or message involves funds or not), registering the account or funds for distribution, or running a node.

- The distributed amount to each account/UTXO must be reasonably calculated and be the same for any user holding the same amount of Digital Asset. This means that two users who hold the same total amount of fungible Digital Asset in any configuration of accounts/UTXOs must receive the same amount of distributed Digital Asset. Such two users can be actual or hypothetical users.

- If the amounts used to calculate the distributed amounts are not taken instantaneously at the distribution time, i.e. a 'snapshot' is taken prior, the amounts used must be no older than 30 UTC days prior to the distribution time.

- The manner of the distribution results in the private keys associated with the account/UTXO to be the only requirement to claim the distributed Digital Assets

8.4 Determination of Proceeds of a Distribution Event

The unit value of the distributed asset will be given by the *Consolidated Price* and this will be multiplied by the *Distribution Quantity* to give the Distribution Proceeds denominated in the quote asset of the index.

8.4.1 Consolidated Price

When a *Distribution Event* has occurred, then at 1000 London time on the next working day of the Distribution Event the Administrator will determine the value of distributed assets that will be the *Consolidated Price*.

8.4.2 Consolidated Price - Methodology

- Observing all transactions conducted for the distributed token against the quote asset of the CF Multi Asset Index on the Qualifying Exchanges (whereas the distributed token is an existing constituent, the Constituent Exchanges) during the period 0900 to 1000 London time

- Dividing the observation window into twelve, five-minute partitions of equal length

- Calculating the volume weighted median of transactions conducted in each five-minute partition

- The Consolidated Price is given as the arithmetic mean of the twelve volume weighted medians calculated in the previous step

8.4.3 Distribution Quantity

The distribution quantity shall be the full amount of distributed Digital Asset that satisfies the Distribution Event conditions.

8.4.4 Re-investment of Distribution Proceeds

For the Total Return Variant of the index, the Distribution Proceeds shall be re-invested into the index proportionate to the index constituent weights at the *Reinvestment Implementation Point*.

9   Treatment of Deductions

Some Digital Assets apply deduction of holder funds if the user does not take any positive action within a certain period. This section discusses treatment of such deductions.

9.1   Deduction Event for Digital Asset holders

A *Deduction Event* of a constituent Digital Asset will be deemed to have occurred, if on the 7th working day after the supply or balance deduction, at the deduction time, the below conditions are met:

1. The deduction must be applied to all users who hold positive balances.

2. The avoidance of such deduction (if possible) must require positive action on the part of the user that requires skill and resources that one cannot reasonably expect of the average, typical Investor.

3. The deducted amount must be reasonably calculated and be the same for any user holding the same amount of Digital Asset. This means that two users who hold the same total amount of fungible Digital Asset in any configuration of accounts/UTXOs must be deducted the same amount of Digital Asset. Such two users can be actual or hypothetical users.

4. If the amounts used to calculate the deducted amounts are not taken instantaneously at the deduction time, i.e. a 'snapshot' is taken prior, the amounts used must be no older than 30 UTC days prior to the deduction time.

9.2   Application of deduction events

Deduction events, unlike distribution events, will apply to both price return and total return indices as one is unable is disavow a deduction. If a Deduction Event is deemed to have occurred, the unit value of the deducted asset will be given by the Deduction Consolidated Price outlined below on the day of the *Reinvestment Determination Point*, and this will be multiplied by the *Deducted Quantity* to give the *Deducted Amount* denominated in the quote asset of the index.

9.3   Deduction Consolidated Price - Methodology

- Observing all transactions conducted for the deducted token against the quote asset of the CF Multi Asset Index on the Constituent Exchanges during the period 0900 to 1000 London time on the next working day after the Deduction Event.

- Dividing the observation window into twelve, five-minute partitions of equal length

- Calculating the volume weighted median of transactions conducted in each five-minute partition

- The Consolidated Price is given as the arithmetic mean of the twelve volume weighted medians calculated in the previous step

The **_Deducted Amount_** shall be deducted from the index at the Reinvestment Implementation Point.

Appendix I – Digital Asset Transaction Model Classification

Digital asset	Symbol	Transaction Model	Native chain
Aave	AAVE	Account Centric	Ethereum network
Algorand	ALGO	Account Centric	Algorand network
Amp	AMP	Account Centric	Ethereum network
Audius	AUDIO	Account Centric	Ethereum network
Augur	REP	Account Centric	Ethereum network
Avalanche	AVAX	Account Centric	Avalanche network
Axie Infinity Shards	AXS	Account Centric	Ethereum network
Bitcoin	XBT	Coin Centric	Bitcoin network
Bitcoin Cash	BCH	Coin Centric	Bitcoin Cash network
Cardano	ADA	Coin Centric	Cardano network
Chainlink	LINK	Account Centric	Ethereum network
Chiliz	CHZ	Account Centric	Ethereum network
Compound	COMP	Account Centric	Ethereum network
Cosmos	ATOM	Account Centric	Cosmos network
Decentraland	MANA	Account Centric	Ethereum network
Curve	CRV	Account Centric	Ethereum network
Dogecoin	DOGE	Coin Centric	Dogecoin network
Ethereum	ETH	Account Centric	Ethereum network
Ethereum Classic	ETC	Account Centric	Ethereum Classic network
Enjin Coin	ENJ	Account Centric	Ethereum network
EOS	EOS	Account Centric	EOS network
Filecoin	FIL	Account Centric	Filecoin network
Flow	FLOW	Account Centric	Flow network

Livepeer	LPT	Account Centric	Ethereum network
Litecoin	LTC	Coin Centric	Litecoin network
Loopring	LRC	Account Centric	Ethereum network
Maker	MKR	Account Centric	Ethereum network
OMG Network	OMG	Account Centric	Ethereum network
Polkadot	DOT	Account Centric	Polkadot network
Polygon	MATIC	Account Centric	Ethereum network
Rarible	RARI	Account Centric	Ethereum network
Ripple XRP	XRP	Account Centric	XRP Ledger
Solana	SOL	Account Centric	Solana network
Stellar Lumens	XLM	Account Centric	Stellar network
Sushi	SUSHI	Account Centric	Ethereum network
Synthetix	SNX	Account Centric	Ethereum network
Tezos	XTZ	Account Centric	Tezos network
The Graph	GRT	Account Centric	Ethereum network
The Sandbox	SAND	Account Centric	Ethereum network
Yearn.network	YFI	Account Centric	Ethereum network
Uniswap	UNI	Account Centric	Ethereum network
Internet Computer	ICP	Account Centric	ICP Network
Ape Coin	APE	Account Centric	Ethereum network
Gala Games	GALA	Account Centric	Ethereum network
Quant Network	QNT	Account Centric	Ethereum network
Immutable X	IMX	Account Centric	Ethereum network
Biconomy	BICO	Account Centric	Ethereum network
Basic Attention Token	BAT	Account Centric	Ethereum network

Appendix II – Constituent Custodial Services Providers

To be eligible for consideration as a Constituent Custodial Services Provider the firm:

1. Must hold a regulatory permission from the relevant regulatory authority that oversees the provision of safe keeping of assets on behalf of third parties.
2. Must publish an up-to date list of assets for which it provides safe keeping services on behalf of third parties which fall under the regulatory permission held.

The list of Constituent Custodial Services Providers is provided below and reviewed annually in September and subject to confirmation by the CF Cryptocurrency Index Family Oversight Function.

Constituent Custodial Service Providers – As of September 2020

- **BitGo**
- **Coinbase Custody**
- **Fidelity Digital Assets**
- **Gemini Custody**

Appendix III – Expert Judgement Applied to the Calculation of the Dogecoin Free Float Supply

A Dogecoin Free Float Supply calculation couldn't be determined using the method described within *Section 4.3 of CF Digital Asset Index Family Multi Asset Series - Ground Rules*. The Administrator used an alternative method to determine the Dogecoin Free Float Supply which was a Ratio of the Dogecoin Free Float Supply over Dogecoin Fungible Supply from the previous quarter snap on 19-May-2023. The Ratio was used as a proxy in the calculation and therefore it was assessed as an Expert Judgement.

- On 28-August-2023 and 20-November-2023 the Administrator used an Expert Judgement in the calculation of the Dogecoin Free Float Supply. The Expert Judgement was used because the Administrator asserted that a primary public third-party dataset, which is used to determined Fungible Supplies and Free Float Supplies, was showing inaccurate and unexpected results for the Dogecoin Free Float Supply.
- There were no concerns in relation to the Dogecoin Fungible Supply, the primary public third-party dataset results were compared to other two public third-party dataset results, the results were consistent across all 3 public third-party datasets.
- In these circumstances the Administrator deemed that it is appropriate to establish a trendline from the historic use of the publicly available primary data and to use the trendline to interpolate the Dogecoin Free Float Supply result.
- The new Dogecoin Fungible Supply was calculated using the primary public third-party dataset and the Dogecoin Free Float Supply was deduced using the Ratio from the previous snap on 19-May-2023.
- This proxy was considered acceptable due to the Free Float Supply over Fungible Supply Ratio being stable quarter on quarter for the previous 2 years. The Administrator applied the Expert Judgement to obtain the most accurate Dogecoin Free Float Supply value based on accessible information.

Notice and Disclaimer