

DIA Data Index Family Rules for Construction and Management

Version 1.0

Change History

Version Number	Editor	Date	Comments
1.0	Davide Di Gioia	17/11/2021	Live document

1.	Product definitions	3
2.	Governance	4
3.	Digital Asset Data Source, Price & Index Data Eligibility	6
4.	Digital Asset Input Price Selection	7
5.	Multicoin Index Digital Asset Selection and weighting	8
6.	Digital Asset Reference Price Calculation	9
7.	Index Calculation	10
8.	Semi-annual review of the DIA Data Index Family	12
9.	Management of the DIA Data Index Family	13
10.	Exceptions and amendments to these Rules	15
11.	Contact details	16
12.	Legal	17
13.	Appendix A: Eligible Exchanges	18
14.	Appendix B: Price / Index Information	19

1. Product definitions

1.1. The DIA Data Index Family

1.1.1. "Economic Reality"

The DIA Data Index Family are benchmark digital assets reference prices and indices which measure the price of individual digital assets, or the performance of a group of digital assets. A further description of each price or index can be found below, together with the methodology for assessing the price or determining the index. Each is designed to ensure the tradability of each price or of the underlying index basket when traded as part of an index portfolio trade.

1.1.2. Members of the DIA Data Family:

Name	Type	Code
DIAx Bitcoin Reference Price	Reference price	
DIAx DIA Reference Price	Reference Price	
DIAx Multiverse Index	Multi-asset (digital assets + equities) index	

1.2. DIAx Data Bitcoin Reference Price

1.2.1. This is designed to provide a reference price for Bitcoin (BTC) by combining traded prices from various exchanges meeting defined criteria, that can be used for the creation of Bitcoin return products, or to measure the price of Bitcoin.

1.3. DIAx DIA Reference Price

1.3.1. This is designed to provide a reference price for DIA (DIA) by combining traded prices from various exchanges meeting defined criteria, that can be used for the creation of DIA return products, or to measure the price of DIA.

1.4. DIAx Multiverse Index

1.4.1. This index comprises the ten digital assets and equities that represent companies with the most significant business projects engaged in building Metaverse functionality in areas including business, gaming and entertainment. The index is designed to both represent the investment performance of a portfolio of Metaverse companies and for use as the underlying for investment products.

2. Governance

2.1. General

2.1.1. The prices / indices are designed to be compliant with both the IOSCO Principles for Financial Benchmarks¹ and the UK & EU Benchmarks Regulations².

2.2. DIA Data

2.2.1. DIA Data is the index provider and owner of the DIA Data Index Family. It contributes research and may propose changes to the methodology, but cannot require such changes and has no involvement in the day to day management of the indices.

2.3. Moorgate Benchmarks Limited

2.3.1. Moorgate Benchmarks Limited is administrator of the DIA Data Index Family. Moorgate is regulated by the Financial Conduct Authority as a registered benchmark administrator under the UK benchmarks regulation and by BaFin as a registered benchmark administrator under the EU benchmarks regulation.

2.3.2. The calculator of this index family is Moorgate Benchmarks Limited ("Moorgate").

2.4. Moorgate Benchmarks Index Management Committee

2.4.1. The Moorgate Benchmarks Index Management Committee is responsible for the day-to-day management of the prices / indices, and for the implementation of these rules. It is therefore responsible for ensuring that this transparent and objective methodology is followed.

2.4.2. It is also responsible, in the event of the methodology not providing a clear process for the management of any situation, for determining the process to be followed.

2.4.3. The committee is composed of a chairman appointed by Moorgate, and a minimum of two additional members selected either from Moorgate staff or external index experts.

2.4.4. The Index Management Committee convenes on a quarterly basis, in the second week of March, June, September and December.

2.5. DIA Data Index Family Oversight Board

2.5.1. The DIA Data Index Family Oversight Board comprises members drawn from Moorgate and from DIA Data, and may also include members drawn from licensees, stakeholders and Moorgate Benchmarks GmbH. Its Chair is appointed by Moorgate Benchmarks.

¹ A statement of compliance with the Principles can be found at www.moorgatebenchmarks.com

² Information and documentation published in compliance with the benchmarks regulations can be found at www.moorgatebenchmarks.com.



- 2.5.2. The Board is responsible for advising Moorgate in matters regarding the management of the rules and for their continuing fitness for purpose, and for advising on potential rules changes, new prices or indices, or the cessation of existing prices / indices. It cannot require changes to prices, indices or the methodology for determining either.
- 2.5.3. The Board convenes on a quarterly basis, or more often if required.
- 2.5.4. Where conflicts of interest may exist these are carefully managed.
- 2.5.5. The Board's powers are delegated to it by the Administrator, Moorgate Benchmarks Ltd, and its exercise of them overseen by the Moorgate Benchmarks Oversight Function.
- 2.5.6. All actions of the Board are subject to review and approval of the Administrator.
- 2.5.7. Full details of its responsibilities are detailed within the Board's terms of reference.

2.6. Methodology Changes

- 2.6.1. Members of the DIA Data Index Family Oversight Board, Moorgate Benchmarks Index Management Committee and stakeholders may at any time recommend changes to these rules (including the reference price and index construction criteria) by submitting any proposed changes for consideration and approval in advance of the Moorgate Benchmarks Index Management Committee's next meeting.
- 2.6.2. Proposed changes that the administrator deems material will be publicly consulted on, according to the policy detailed within the Moorgate Benchmarks Cessation or Material Change Policy, available from www.moorgatebenchmarks.com.
- 2.6.3. Following approval by the Index Management Committee, such changes shall be implemented by way of an update to these rules, which shall be published on www.moorgatebenchmarks.com.
- 2.6.4. Except in exceptional circumstances, new rules and rules adjustments will become effective after the following review.

2.7. Additional Documentation

- 2.7.1. The administration of the DIA Data Index Family is subject to various policies and procedures, and in particular, the Moorgate Benchmarks:
 - Control & Accountability frameworks
 - Material changes and cessation policy
 - Error correction policy

3. Digital Asset Data Source, Price & Index Data Eligibility

3.1. Data Source

- 3.1.1. Data is collated by DIA Data from various sources. DIA (Decentralised Information Asset) is an open-source oracle platform that enables market actors to source, supply and share trustable data.
- 3.1.2. Digital assets are mainly traded on centralised and decentralised exchange markets (CEX and DEX). Centralized markets generally require traders to open accounts, and transfer their assets to a centralised wallet belonging to the exchange. Trading on the off-chain trading engine belonging to the exchange. Only when an asset is transferred from the exchange to another wallet, a change of ownership can be recorded on-chain.
- 3.1.3. In contrast, DEXes operate entirely on-chain and assets are exchanged directly from wallet to wallet. While this removes the requirement for accounts and trust in the exchange itself, it also restrains the tradable assets to ones that are accessible to the on-chain component representing the DEX (usually a smart contract). Also, on-chain transaction costs can be higher than in an off-chain system due to gas usage.
- 3.1.4. Thus, conversion between assets from incompatible blockchains is restricted to centralized exchanges, as well as conversion between crypto and fiat assets .
- 3.1.5. Data for use in the DIA Data Index Family is sourced from both Decentralised and Centralised Exchange markets.

3.2. Exchange Eligibility

- 3.2.1. Exchanges are screened for eligibility using publicly available information, to assess the suitability of exchanges for trading and investment purposes. This assessment determines whether an exchange's pricing may be used within the DIA Data Index Family.
- 3.2.2. DIA Data makes this assessment using objective criteria set by and overseen by the DIA Data Index Family Oversight Board.

3.3. Exchange Price Eligibility

- 3.3.1. Individual digital asset trading pairs available from eligible exchanges are assessed for eligibility for use within the DIA Data Index Family.

Seasoning

- 3.3.2. A feed of transaction-based prices with at least daily pricing must have been received for a period of at least one month.

Liquidity eligibility

- 3.3.3. Digital assets trading on centralised exchanges with an average-daily trading value of less than \$ 1,000,000 for the current quarter are removed from the eligible universe.



4. Digital Asset Input Price Selection

- 4.1.1. The input prices for Reference Prices combine trade data from multiple sources to establish a single price for an individual digital asset.
- 4.1.2. All trades in eligible coin pairs received from eligible exchanges are used in the calculation of the relevant DIA Data digital asset reference price.
- 4.1.3. For details of the precise calculation refer to section 6.1.

5. Multicoin Index Digital Asset Selection and weighting

5.1.1. For each index, Moorgate Benchmarks builds an initial selection of potential index constituents as per the eligibility requirements outlined below.

5.2. DIAx Metaverse Index

Theme eligibility

5.2.1. To be eligible, a digital asset or equity must be categorized by Decentralised Information Asset (DIA) as meeting the Metaverse definition. (See section 1.4 above).

Pricing eligibility

5.2.2. Pricing must be available from a minimum of three sources.

Constituent Coin Selection

5.2.3. DIA Data assesses the exposure of potentially eligible coins and equities to the theme, as per the description in section 1.4 above, and selects the ten that are most exposed to the theme.

Constituent Coin Weighting

5.2.4. DIAx Metaverse Index constituents are equally weighted at each periodic review, with weights allowed to fluctuate between reviews.

6. Digital Asset Reference Price Calculation

6.1. Determining a dollar price

- 6.1.1. The vast majority of recorded trades by DIA are between two crypto assets. Only a minority of trades against fiat currencies is recorded on CEXes. Nonetheless, DIA reports all asset prices in USD, even for numerous assets where only crypto-crypto pairs exist.
- 6.1.2. To retrieve a USD price for each and every asset, DIA uses a price estimator. The price estimator is updated with every recorded trade. Each trade consists of a base token and a quote token.
- 6.1.3. The price of a quote token is measured in base tokens. Because the order in a trade of base token and quote token is arbitrary, USD is always considered as a base token. Other fiat currencies are also always base tokens, except when measuring the ECB exchange rates. An asset needs to be a quote token in at least one market in order to be able to determine a USD price.

Exclusion of outliers

- 6.1.4. Outliers are identified by Interquartile Range (IQR) following the below method:

$$IQR = Q_3 - Q_1$$

$$Outliers = \left\{ \begin{array}{l} \textit{smaller than } Q_1 - 1.5 * IQR \\ \textit{or} \\ \textit{larger than } Q_3 - 1.5 * IQR \end{array} \right.$$

Where:

IQR = interquartile range

Q₁ = first quartile

Q₃ = third quartile

- 6.1.5. Asset prices transacted in denominations other than USD are converted to USD via a chain of trades ending at a fiat pair.
- 6.1.6. The price for each digital asset is calculated as a trade volume-weighted 120-second moving average.

7. Index Calculation

7.1. Calculation formula

7.1.1. Index levels are calculated using the following formula:

$$Index_t = \frac{\sum_{i=1}^N P_{i,t} \times CSN_{i,q} \times C_{i,q}}{D}$$

Where:

$Index_t$	= Index level on day t
$P_{i,t}$	= denotes the price of the constituent i at time t , Intraday or end of day
$CSN_{i,q}$	= Circulating Supply Number of the constituent i / <i>Float-adjusted equity shares in issue (as appropriate)</i> in quarter q
$C_{i,q}$	= Capping factor for a constituent i in quarter q (if used)
D	= Index Divisor
N	= Number of constituents

7.2. Divisor Adjustments

7.2.1. The index calculation incorporates a divisor, which can be adjusted to allow changes in CSN, free float, addition or deletion of coins & equities and other events to be implemented in the index without distorting the index price.

$$Divisor_{new} = Divisor_{old} * \frac{\sum_{i=1}^N P_{i,t} \times CSN_{i,q} \times C_{i,q}}{\sum_{i=1}^S P_{i,t} \times CSN_{i,a} \times C_{i,a}}$$

Where:

$CSN_{i,q}$	= Circulating Supply Number of the constituent i / <i>Float-adjusted equity shares in issue</i> in quarter q
$C_{i,a}$	= Capping factor for a constituent i in quarter $q-1$
$Divisor_{old}$	= Previous Index Divisor in quarter $q-1$
S	= Number of constituents in quarter $q-1$

7.3. Index versions calculated

7.3.1. Indices are calculated as price returns and total returns.

7.3.2. Indices are calculated in USD.

7.3.3. Indices are calculated between 00:00 Mondays and 24:00 Fridays (UTC), and the index values are disseminated to data vendors every 120 seconds.

7.3.4. Each Index's spot price is disseminated daily as a daily closing value 16:00 (UTC).



7.4. Index Distribution

- 7.4.1. Reference prices and indices are published via various data vendors. Each vendor determines whether they will distribute/display the data via their respective information systems.
- 7.4.2. The composition of indices, as well as the respective weightings of index constituents, which shall be published on a retrospective basis in respect of each review date on the business day immediately following the next review date, is made available on www.moorgatebenchmarks.com.

8. Semi-annual review of the DIA Data Index Family

8.1. Timings

8.1.1. The DIA Data Index Family is reviewed semi-annually, using the process described below.

8.1.2. Dates applicable to reviews are detailed below:

Date	Name	
Last business day of February and August	Determination date	Date on which data is collected for use in the index review.
On or before the second Friday of March and September	Review release date	Date on which the results of the review are published.
Third Friday of March and September	Implementation date	Date on which the results of the review are implemented in the index.

8.2. Review process

8.2.1. Each reference price and index is re-created from first principles, according to the timetable above.

8.2.2. The results of the semi-annual review process are published on the review release date.

8.2.3. The results of the semi-annual review process are implemented at the close of business on the implementation date.

9. Management of the DIA Data Index Family

9.1. Management of DIA Data Single Coin Reference Prices

- 9.1.1. As single coin reference prices reflect the price of the defined underlying coin, DIA Data Single Coin Reference Prices are not adjusted to account for network events, including forks.

9.2. Management of Hard Forks in Indices

- 9.2.1. A hard fork arises when a Blockchain protocol is completely changed. As a result, participants taking part in transactions on the old Blockchain must upgrade to the new one with the object of continuing validating transactions in the new Blockchain.
- 9.2.2. Nevertheless, participants that do not upgrade may continue to support and validate transactions on the old Blockchain protocol separately. As a result, a Blockchain splits into two:

Holders receive 'B' new coins for every 'A' coin held:

$$price_{(i,adj)} = ((price_{(i)} * A) - (price\ of\ forked\ coin * B))/A$$

- 9.2.3. Where in the view of the administrator digital asset B is available for trading on at least one eligible exchange, digital asset B is added to the index according to the calculation above, at the close time on the day following the fork.
- 9.2.4. The new asset(s) will be removed on the day following addition.³

9.3. Equity corporate events

- 9.3.1. Corporate events that arise in constituent equities will be handled as per the approach detailed in the Moorgate Benchmarks Equity Index Corporate Actions Guide.

9.4. Absence of pricing

- 9.4.1. Where one or more component price feeds ceases, temporarily or otherwise, the relevant Reference Price will continue to be calculated using the remaining available prices.¹
- 9.4.2. If no price is available for a Reference Price, the Reference Price calculation will cease to be disseminated and the Moorgate Benchmarks Material Change and Cessation Policy invoked.
- 9.4.3. In the event of an ongoing absence of pricing, the administrator reserves the right to remove a coin between reviews, where it considers it appropriate. Any such decision will be referred to the DIA Data Index Family Oversight Board for review.

³ In the unlikely event that the new asset created by a fork is widely believed to be replacing the previous asset, the administrator reserves the right to retain the new asset and to remove the original asset.



9.5. Delistings

9.5.1. Digital assets or equities that are delisted from all exchanges that are used for input pricing are removed from the indices at a price of zero on the final delisting date.

9.6. Errors

9.6.1. If an error is discovered in a reference price or index value Moorgate Benchmarks will follow the process outlined in the “Moorgate Benchmarks Error Correction Policy”, available at www.moorgatebenchmarks.com.

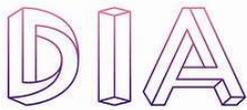
10. Exceptions and amendments to these Rules

10.1. Exceptions

- 10.1.1. Moorgate Benchmarks shall apply the method described above for the composition and calculation of the reference prices and indices. However, it cannot be excluded that the market environment, supervisory, legal, financial or tax reasons may require unforeseen changes to be made to the DIA Data Index Family. Where possible, such changes will be made in conjunction with the DIA Data Index Family Oversight Board, and in all instances, reported to that body.
- 10.1.2. Wherever exceptions are required, Moorgate Benchmarks will endeavour to ensure a calculation method is applied that is consistent with the method described in this document.

10.2. Amendments

- 10.2.1. Moorgate Benchmarks Limited and DIA Data notify users of the reference prices and indices that whilst it is the policy of Moorgate Benchmarks as administrator to consult fully on any possible change to a reference price or index, it is possible that circumstances, particularly external events beyond the control of Moorgate Benchmarks and DIA Data, may necessitate immediate changes to, or the cessation of, a reference price or index and therefore, any financial contracts or other financial instruments that reference the reference prices or indices, or any market participants that use the reference prices or indices in valuations should plan to be able to manage the possibility of changes to, or cessation of, the reference prices or indices. Please consult the Moorgate Benchmarks Cessation or Material Change Policy for further details.
- 10.2.2. The DIA Data Index Family Oversight Board may prescribe changes to the selection criteria and other rules governing the reference prices or indices and the method applied to calculate the reference prices or indices, which it deems to be necessary and desirable in order to prevent material errors or to remedy, correct or supplement the rules currently described in these Guidelines.
- 10.2.3. Moorgate Benchmarks shall ensure that any amendments to the methodology are updated and published as soon as possible after any changes to the indices are implemented and shall notify all persons who have licensed the use of the indices as far in advance of such implementation as reasonably practicable.



11. Contact details

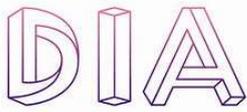
- 11.1.1. The index provider, DIA Data, can be contacted at indexes@diadata.org. More information is available at docs.diadata.org.
- 11.1.2. The index administrator, Moorgate Benchmarks Ltd, can be contacted at info@moorgatebenchmarks.com. More information is available at www.moorgatebenchmarks.com.

12. Legal

- 12.1.1. DIA Data or any successor thereto (the "Index Owner") owns intellectual property rights in the DIA Data Index Family and its methodology (excluding methodological elements not developed specifically for the creation of the DIA Data Indices). Any use or publication of such intellectual property, as well as of the DIA Data trademark or any other DIA Data related methodologies, provisions or values must be with the prior written consent of the Index Provider.
- 12.1.2. The Index Owner is acting solely in its capacity as the provider of the Index and does not undertake any administration duties in relation to the Index. Notwithstanding the foregoing, the Index Owner may, where permitted by the administrator, undertake certain tasks such as sourcing and making available the water risk data, and representatives may serve on the DIA Data Index Family Oversight Board.
- 12.1.3. The Index Owner assumes no obligation, duty or liability to any person in relation to the Index save as provided in any written agreement with such person. The Index Owner makes no express or implied warranty as to:
- a) the advisability of purchasing or assuming any risk in connection with any transaction related to the Index;
 - b) the levels at which the Index stands at any particular time on any particular date;
 - c) the results to be obtained by any party from the use of the Index or any data included in it for the purposes of issuing securities or carrying out any financial transaction;
 - d) any other matter.
- 12.1.4. The Index Provider may assign the proprietary rights in the Index to a third party in its reasonable discretion.

12.2. Licensing

- 12.2.1. Licenses to use the indices as the underlying value for investment products and derivative instruments may be issued to stock exchanges, banks, financial services providers and investment houses by the Index Provider.



13. Appendix A: Eligible Exchanges



14. Appendix B: Price / Index Information

Index	Index code	Price return ticker	Net return ticker	Gross return ticker	Base date	Base value
DIAx Metaverse Index					01/04/2021	1000

ⁱ The loss of price sources may impact eligibility when assessed at following periodic rebalances.