



BITWISE INDEX SERVICES, LLC

The Bitwise Crypto Index Methodology

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I. GUIDING PRINCIPLES AND INDEXING APPROACH

The Bitwise Crypto Indexes were developed to provide investors with a clear, rules-based, and transparent way to track the value of individual cryptoassets and groups of cryptoassets. The indexes are designed as investable benchmarks, suitable both for benchmarking active strategies and serving as underlying indexes for index-tracking funds.

The cryptomarket is new and presents many challenges to well-established protocols for indexing traditional assets such as stocks and bonds. The Bitwise Crypto Indexes aim to combine the best of traditional asset indexing methodologies with appropriate adjustments to adapt those practices to the crypto space.

The guiding principles of the Bitwise Crypto Indexes include:

- Index and pricing decisions must follow a clear, rules-based, and transparent process.
- If the judgment of the Bitwise Crypto Index Committee is required when applying those rules, decisions will be made public with full documentation of the decision-making process.
- Indexes are designed in all aspects to be investable and replicable; as such, they will take into account measures surrounding liquidity, capital controls, exchange stability, custody limitations, and other factors in a rules-based manner.

II. GOVERNANCE

The Bitwise Crypto Indexes will be governed by the Bitwise Crypto Index Committee with the support of the Bitwise Crypto Index Advisory Board.

A. Bitwise Crypto Index Committee

i. **Overview:** The Bitwise Crypto Index Committee has sole responsibility for developing, maintaining, and adjusting the Bitwise Crypto Index Methodologies, and for verifying the data sources used to calculate those indexes.

ii. **Responsibilities:** The Committee meets monthly on the 20th of the month (or the first U.S. business day following the 20th of the month) with the following goals:

- Review and verify all data sources—existing and proposed—contributing to the Bitwise Crypto Indexes for uptime, accuracy, and robustness
- Review and approve new methodologies or changes to existing methodologies to the Bitwise Crypto Indexes
- Review and approve all methodological decisions that require judgment, and provide detailed public explanations of those decisions
- Handle other matters on an as-needed basis

The indexes rely on the New York Stock Exchange’s public holiday calendar to determine what counts as a “business day.”

iii. **Voting:** Decisions are made by a simple vote of a majority of the members of the Committee present at the meeting. A quorum of two members is required for a meeting to take place.

iv. Committee Members and Bios

a. Chairman: Matt Hougan

Matt Hougan is Global Head of Research for Bitwise Asset Management. He oversees development of the Bitwise index methodologies, conducts fundamental research on cryptoassets, and works to educate professional investors on the role cryptoassets can play in a portfolio. Prior to joining Bitwise, he was CEO of Inside ETFs and Managing Director of Global Finance at Informa. Earlier, Hougan was CEO of ETF.com. He is a member of the ETF Hall of Fame and co-author of the CFA Institute's monograph of ETFs.

B. Member: John Hyland, CFA

John Hyland is Global Head of Exchange-Traded Products for Bitwise Asset Management. He spearheads the company's efforts to develop and list ETPs around the world. Prior to joining Bitwise, Hyland was Chief Investment Officer for US Commodity Funds, where he helped launch the first crude oil ETF, the first natural gas ETF, and the first copper ETF, among other products. Hyland is the former President of the San Francisco CFA Society.

C. Member: Phil Glazer

Phil Glazer is a crypto researcher at Bitwise Asset Management. He focuses on examining all aspects of the cryptomarket, from cryptoeconomics to liquidity, regulation, and other factors. Prior to joining Bitwise, Glazer was an investor with Maschmeyer Group Ventures, a leading family office, with a focus on cryptocurrency, blockchain applications, and financial technology.

B. Bitwise Crypto Index Advisory Board

i. **Overview:** The Bitwise Crypto Index Advisory Board (the "Advisory Board") is composed of leading experts in the fields of both traditional asset indexing and cryptoassets. The role of the Board is to provide considered opinions on critical issues facing the Bitwise Crypto Index Committee, and to make recommendations on potential changes to the methodologies surrounding Bitwise's indexes.

ii. **Responsibilities:** The Advisory Board meets on a quarterly basis and on an ad hoc basis as requested by the Bitwise Crypto Index Committee, and will address specific issues where insight and perspective will be additive to the efforts of the Committee. Advisory Board suggestions are not binding to the Index Committee.

iii. **Advisory Board Members and Bios**

a. **Chairman: Matt Hougan**

Matt Hougan is Global Head of Research for Bitwise Asset Management. He oversees the development of the Bitwise index methodologies, does fundamental research on cryptoassets, and works to educate professional investors on the role cryptoassets can play in a portfolio. Prior to joining Bitwise, Hougan was CEO of Inside ETFs and Managing Director of Global Finance at Informa. Earlier, he was CEO of ETF.com. Hougan is a member of the ETF Hall of Fame and co-author of the CFA Institute's monograph of ETFs.

b. **Member: Spencer Bogart, CFA**

Spencer Bogart is a Partner at Blockchain Capital, the general partner of Blockchain Capital's venture funds. He is a fundamental investment analyst with a rare combination of deep experience analyzing cryptocurrencies as well as traditional equity opportunities. Prior to joining Blockchain Capital, Bogart was a Vice President at Needham & Company, where he authored Wall Street's first industry report highlighting the use cases, companies, and potential of blockchain technology. Bogart was the most active bitcoin analyst on Wall Street, writing detailed reports and research on bitcoin's fundamental value proposition, price forecast, and technical advancements.

c. **Member: Srikant Dash, CFA**

Srikant Dash is one of the world's foremost experts on indexing and index construction. He spent 12 years at Standard & Poor's, where he was Managing Director and Global Head of Research & Design. While at S&P, Dash led the team that created the industry's first smart-beta products based on factors, dividends, and themes. Today over \$200 billion in ETF assets track indexes he built. Dash also created the landmark SPIVA (Standard & Poor's Index vs. Active)

report, the primary way active managers are benchmarked to index performance on an industrywide level. He was a long-standing member of the S&P 500 Index Committee. Dash later joined Bloomberg as Global Head of the Index Business, transforming Bloomberg into the largest fixed-income, commodity, and currency index firm in the world. He is also an independent director on the board of subsidiaries of the National Stock Exchange, the largest Indian exchange.

III. ELIGIBILITY REQUIREMENTS

The Bitwise Crypto Indexes are designed to capture the investable market opportunity for cryptoassets around the world. This section outlines the rules governing which assets and exchanges contribute to the indexes.

A. Cryptoasset Exchange Eligibility Requirements

i. Eligibility Requirements

Bitwise considers an entity to be an Eligible Cryptoasset Exchange if it meets all of the following criteria:

- a. Provides an open platform for exchanging at least one cryptoasset for either another cryptoasset or for a fiat currency

Explainer: This requirement exists to identify the set of institutions to consider for further analysis.

- b. Is not domiciled in a country, region, or locality that implements meaningful capital controls on international investors

Explainer: This requirement exists to eliminate assets or price inputs from exchanges that are not accessible by international investors. The cryptomarket has seen unusual premiums and/or discounts emerge in markets where meaningful capital controls exist.

- c. Is in compliance with local regulations and not subject to extraordinary regulatory or legal action

Explainer: This requirement exists to limit exchanges to those that are positive actors in the community, and to limit the potential for interruptions in service or unusual pricing due to government or regulatory enforcement actions.

d. Charges fees for trading

Explainer: Exchanges that do not charge fees for trading can create artificial distortions in trading volume and pricing due to wash-sale activity. It is difficult to disaggregate this fake volume from meaningful trades (if any) on exchanges with no fees.

Note that exchanges that engage in “trade mining” --- the practice of compensated individuals with an exchange-specific coin for trading other coins on that exchange, as a way of offsetting the cost of executing transactions --- are excluded under this clause as well.

e. Has a functioning, secure, and reliable application programming interface (API) allowing for the timely ingestion of trade and volume data

Explainer: A functioning, secure, and reliable API is required to onboard data from exchanges. In addition, it is a test of the reliability, transparency, and robustness of the exchange itself.

f. Has no significant downtime, withdrawal, or known security issues

Explainer: This requirement exists to protect the index methodology from pricing or asset inclusion distortions that arise at exchanges with significant downtime, withdrawal, or known security issues.

g. Accounts for more than 0.1% of the combined trailing 30-day dollar trading volume of all cryptoassets on entities that meet rules III.A.i.a through III.A.i.f

Explainer: This requirement exists to ensure that the index captures only robust exchanges where sufficient volume exists to support accurate price discovery. In addition, excluding the long tail of small exchanges eliminates significant engineering and maintenance burden that would have little to no impact on the resulting price data. The Bitwise Crypto Index Committee reserves the right to add additional exchanges that fall outside of the 0.1% requirement as contributors if it deems those exchanges systemically important.

Such designations will be made public in the meeting minutes of the Bitwise Crypto Index Committee.

ii. Review of Eligibility and Emergency Removal

a. Normal Review: The Bitwise Crypto Index Committee will review the list of Eligible Cryptoasset Exchanges on a monthly basis.

Explainer: Failure to meet any of the Eligibility Requirements speaks to emergent risks to the quality of data coming from a cryptoasset exchange.

b. Emergency Loss of Eligibility: Under extraordinary circumstances, exchanges may lose eligibility immediately by a unanimous vote of the quorum of members of the Bitwise Crypto Index Committee. The Committee will post meeting minutes of that removal online.

Explainer: This rule exists to allow the Bitwise Crypto Index Committee to stop Eligible Cryptoasset Exchanges from contributing prices to its indexes in extraordinary situations where Bitwise has reason to believe the pricing from those indexes is not reflective of true price discovery in a given asset.

iii. Use of Eligible Cryptoasset Exchange Subsets for Calculating New Indexes or Index Variants

The Bitwise Crypto Index Committee may elect to create new indexes, or variations on existing indexes, using defined subsets of the complete list of all Eligible Cryptoasset Exchanges. For example, an index could be constructed which restricts its pricing inputs from Eligible Cryptoasset Exchanges selected on the basis of legal domicile of the exchange, or specific regulatory status of the exchange, or alternative trading volume minimums, or any other factor that the Committee may elect to use. Any indexes using subsets of the Eligible Cryptoasset Exchange will be clearly labeled as such.

B. Cryptoasset Eligibility Requirements

The Bitwise Crypto Indexes draw core constituents from their list of eligible cryptoassets, which comprise those items that meet each of the following Eligibility Requirements:

i. Eligibility Requirements

a. Is a cryptographically secured digital bearer instrument

Explainer: Bitwise uses a broad definition of cryptoassets to capture all coins and tokens associated with public blockchains, including those using a variety of different consensus mechanisms.

b. Has a price that is not pegged to another cryptoasset, fiat currency, group of those currencies, or hard asset

Explainer: The Bitwise Crypto Indexes exclude stablecoins and other pegged assets from consideration, as the indexes are built for investors searching for returns as opposed to stable values.

c. Is freely traded and can be freely held for the foreseeable future

Explainer: This requirement exists to ensure that assets may be traded and stored in a manner that is acceptable to an institutional investor. It also allows for the removal of assets with known terminations or pending illiquidity, such as those that arise from the announced freezing of a placeholder token at the end of a registration process, among other potential situations.

d. Trades on two or more eligible cryptoasset exchanges, without withdrawal issues specific to that cryptoasset, and has no more than 90% of its combined 30-day trailing dollar trading volume on any single eligible cryptoasset exchange.

Explainer: This requirement exists to ensure robustness in the exchange ecosystem supporting any given cryptoasset. It guarantees that at least two exchanges support a given asset and that the second (third, fourth, etc.) exchange(s) is (are) sufficiently robust to maintain smooth trading in the event of a failure at any single

exchange. Note: This rule takes into account withdrawal issues on an asset-by-asset basis at each exchange.

e. Allows for air-gapped cold storage, including offline wallet generation and offline transaction signing

Explainer: This requirement exists to ensure that assets in the indexes can be held in a secure manner. The process for determining if a cryptoasset qualifies under this standard is to:

i) Check if that cryptoasset can be custodied either by an established third-party crypto custodian approved by the Bitwise Crypto Index Committee or by either the Ledger or Trezor hardware wallets.

ii) Check for the availability of a custom software wallet that, in the opinion of the Bitwise Crypto Index Committee, has widespread community support and allows for air-gapped cold storage, offline wallet generation, and offline transaction signing.

f. Has no known security vulnerabilities, including critical bugs, undue exposure to 51% attacks, or other factors, as determined by the Bitwise Crypto Index Committee

Explainer: This requirement exists to ensure that the asset is not knowingly exposed to a critical security risk that could lead to a significant loss in value.

g. Has traded more than 10% of its free-float and inflation-adjusted market capitalization on eligible cryptoasset exchanges over the past 30 days.

Explainer: This requirement exists to ensure that the cryptoassets included in the index are sufficiently liquid to facilitate easy investment and withdrawals.

ii. Loss of Eligibility and Exceptions

a. Normal Loss of Eligibility: Assets will lose eligibility and be removed from all indexes at the next regular reconstitution event if they violate any of the listed Eligibility Requirements for 30-consecutive days.

Explainer: Failure to meet any of the Eligibility Requirements for individual cryptoassets speaks to emergent risks surrounding that asset. The 30-consecutive-day provision avoids unnecessary churn caused by individual-day point failures.

b. Emergency Loss of Eligibility: Under extraordinary circumstances, assets may lose eligibility and be removed on a same-day basis by a unanimous vote of the quorum of members of the Bitwise Crypto Index Committee. Such emergency removals will take place at 4:00 p.m. ET following the conclusion of the meeting and public posting of that notice at www.bitwiseinvestments.com.

Explainer: This rule exists to allow the Bitwise Crypto Index Committee to act quickly in the event of truly extraordinary circumstances, including major security breaches, regulatory action, or identified fraud that imperils the value of an eligible cryptoasset.

c. Hard Forks Exemption: Hard Forks are granted a 45-day exemption to rule III.B.i.d.

Explainer: Hard forks are new cryptoassets that are granted to holders of existing cryptoassets when portions of the consensus nodes adopt different policies. In the event of a hard fork, holders of an existing cryptoasset end up with ownership of both the original cryptoasset and the new, hard-forked cryptoasset. These hard-fork assets can be significant in size and importance in the marketplace.

To reduce unnecessary turnover in the indexes, hard forks are given a 45-day exemption to the volume-related portions of the Core Eligibility Requirements, so that they are not reflexively removed from indexes due to their “newness.”

iii. Use of Restricted Or Alternative Weightings of Eligible Cryptoasset Subsets for Calculating Indexes

The Bitwise Crypto Index Committee may elect to create new indexes, or variations on existing indexes, using defined subsets of the complete list of all the eligible cryptoassets and/or alternative weighting schemes. For example, an index could be constructed that restricts the maximum percentage of eligible cryptoassets based on the judgment of the Index Committee that such coins are more likely than not to be deemed unregistered securities or that may raise other regulatory concerns, or that makes use of alternative trading volume or market-capitalization minimums, or any other factor that the Committee may elect to use. Any indexes using subsets of all eligible cryptoassets will be clearly labeled as such.

IV. ASSET PRICING METHODOLOGY

The Bitwise Crypto Indexes are designed to capture the investable market opportunity for cryptoassets around the world. This section outlines how Bitwise identifies the accurate price and market capitalization of cryptoassets, and how it handles network distributions including hard forks, airdrops, and emissions.

A. Bitwise Cryptoasset Price

The Bitwise Crypto Indexes intend to reflect the price at which an institutionally oriented investor can trade any given cryptoasset. This price is called the Bitwise Cryptoasset Price (CAP) and is used in calculating Bitwise index values (except in the case of certain network distributions, as described in IV.B). The default denomination of a CAP is the U.S. dollar, and the methodology is as follows:

i. Calculating Cryptoasset Prices In U.S. Dollars

The cryptoasset world has two modalities of trading: crypto-to-fiat trading and crypto-to-crypto trading. To create a single unified price for every cryptoasset, all trading pairs must be standardized to price that asset in a single currency (for the Bitwise Crypto Indexes, this currency is the U.S. dollar). The steps to do that are listed below in the order that they are followed:

a. Select Quote Cryptoassets: To avoid circular pricing when standardizing crypto-to-crypto trading pairs, Bitwise must select a group of "Quote Cryptoassets." Quote Cryptoassets are determined on a quarterly basis at the Index Committee meeting that precedes the start of a new calendar quarter.

Quote Cryptoassets are those that:

i. Have crypto-to-fiat trading on at least two eligible cryptoasset exchanges that allow for institutional deposits and withdrawals in a noncapital-controlled fiat currency (henceforth called an Eligible Fiat Currency).

Explainer: This rule exists to ensure that institutional investors can sell Quote Cryptoassets for an eligible fiat currency and withdraw funds. The rule requires two eligible cryptoasset exchanges for reasons of robustness and to show independent adoption of the cryptoasset. Exchanges are excluded if they have withdrawal issues.

ii. Are the largest crypto trading pair (measured by trailing 30-day dollar trading volume) for at least one of the top 100 eligible cryptoassets in each of the past three months, as defined in 6.A.iv.

Explainer: This requirement exists to ensure that Quote Cryptoassets have strong price discovery and are critical to the ecosystem. Focusing on the top trading pair of a top 100 currency ensures that each Quote Currency is systemically important for investors, while the three-month requirement ensures that it has staying power within the community.

As of June 30, 2018, Quote Cryptoassets were:

- Bitcoin (BTC)
- Ethereum (ETH)

b. Calculate Quote Cryptoassets CAPs: Quote Cryptoassets are unique in that the Bitwise Crypto Indexes only consider fiat-to-crypto trades when calculating their CAPs, as the goal is to calculate the fiat-convertible price of eligible cryptoassets that have crypto-to-crypto trading pairs.

The CAP for a Quote Cryptoasset is calculated as follows:

i. Aggregate all crypto-to-fiat trading pairs for eligible fiat currencies that take place on eligible cryptoasset exchanges, removing any pairs that face withdrawal issues.

- ii. Transform all non-U.S.-dollar fiat trading pairs into U.S. dollar prices using synchronous data from an established FX reference data provider.
- iii. Calculate the U.S. dollar volume over the previous hour for each crypto-to-fiat trading pair.
- iv. Assign each trading pair a contribution weight based on its share of total dollar trading volume in a given asset over the previous hour.
- v. Multiply the last traded price (adjusted into U.S. dollars) for each exchange pair by its contribution weight. In the event that no trading price is pulled for a particular trading pair either due to technical reasons or to a lack of trading volume, the Bitwise Crypto Index Committee may substitute a fair market value estimate for that price or eliminate that price from consideration.
- vii. Sum to find the CAP.

c. Calculate the CAP for Non-Quote Cryptoassets: Many cryptoassets trade (sometimes exclusively) in pairs with other cryptoassets. The process for translating these crypto-to-crypto pairs along with crypto-to-fiat pairs into an aggregate CAP is as follows:

- i. Consider both crypto-to-fiat trading pairs and crypto-to-crypto trading pairs on eligible cryptoasset exchanges, excluding any exchange pairs that have withdrawal issues.
- ii. Exclude all trading pairs that are not denominated in either eligible fiat currencies or Quote Cryptoassets.
- iii. Transform all non-U.S.-dollar fiat trading pairs into U.S. dollars using synchronous FX data from an established FX data supplier.

- iv. Use the synchronous CAP for the relevant Quote Cryptoassets to translate crypto-to-crypto pairs into a crypto-to-U.S.-dollar equivalent.
- v. Calculate the U.S. dollar volume for each trading pair and assign each pair a contribution weight based on its share of total U.S. dollar trading volume in a given cryptoasset over the past hour.
- vi. Multiply the last traded price (adjusted into U.S. dollars) by its contribution weight. Note: In the event that no trading price is pulled for a particular trading pair either due to technical reasons or a lack of trading volume, the Bitwise Crypto Index Committee may substitute a fair market value estimate for that price or eliminate that price from consideration.
- viii. Sum to find the CAP.

ii. Extraordinary Exclusions and Pricing

In the event that one or more of the exchange pairs contributing to a CAP is found ineligible for any reason, and as a result an eligible cryptoasset trades on fewer than two eligible cryptoasset exchanges for a time period, the Bitwise Crypto Index Committee reserves the right to assign a daily fair value estimate to that asset until such a time that a CAP can be restored. The fair value process will attempt to incorporate all available pricing resources, considering the validity of those sources and taking into account liquidity concerns and other issues.

Explainer: Cryptoassets must trade on at least two eligible cryptoasset exchanges to receive a CAP and be eligible to enter a Bitwise Crypto index. It is possible, however, for one or more of those exchanges to lose eligibility, leaving the asset with one (or even zero) eligible cryptoasset exchanges contributing live pricing data. This rule allows for Bitwise to price those assets during the 30-day grace period that eligible cryptoassets have to cure an exchange- or trading-related eligibility violation under rule 3.B.ii.a.

B. Treatment and Pricing of Network Distributions

Holders of cryptoassets occasionally receive valuable distributions from a variety of sources.

I. Definitions of Network Distributions

- **Hard Forks:** Hard forks are new cryptoassets that are granted to holders of existing cryptoassets when portions of the consensus nodes adopt different policies. When a hard fork occurs, the Bitwise Crypto Indexes consider the asset with the larger post-fork, free-float and five-year inflation-adjusted market capitalization to be the original coin, and the asset with smaller post-fork, free-float and five-year inflation-adjusted market capitalization to be a new asset.
- **Emissions:** Some cryptoassets provide regular awards to holders in the form of cryptoasset grants, typically in the form of “gas” that powers transactions on the network itself.
- **Airdrops:** An airdrop occurs when a new or emergent cryptoasset is granted to holders of an existing cryptoasset on a one-off or occasional basis.

ii. Pricing of Network Distributions

In ordinary situations, Bitwise Crypto Indexes will hold network distributions at a value of zero until the point that they have a CAP.

In extraordinary situations, the Bitwise Cryptoasset Index Committee reserves the right to make a fair value estimate of the value of coins created through a hard fork prior to such coin satisfying the “two eligible cryptoasset exchange” rule. The fair value process will attempt to incorporate all available pricing resources, considering the validity of those sources and taking into account liquidity concerns, adoption risks for the new cryptoasset and other issues. It is the policy of the Committee to exercise this right only in rare situations where a failure to do so would lead to a material misrepresentation of the value of the cryptoassets tracked. Fair value estimates will be published on www.bitwiseinvestments.com.

Explainer: In rare situations, a new cryptoasset could emerge from a hard fork that has substantial value but does not (for whatever reason) satisfy the requirements to have an official CAP. For instance, there could be a multiday lag between a hard fork occurring and the availability of a new cryptoasset on two or more eligible cryptoasset exchanges. In situations where the failure to account for the value of this asset would lead to a material misrepresentation of the value of an index, this rule allows for the use of a fair value estimate. As soon as a CAP is available, it becomes the controlling price for that cryptoasset.

V. MARKET CAPITALIZATION, FREE-FLOAT ADJUSTMENT AND INFLATION ADJUSTMENT

The Bitwise Crypto Indexes aim to capture the importance of each cryptoasset in the ecosystem, as measured by the aggregate value investors assign to that asset. To do so, Bitwise must calculate the market capitalization of each cryptoasset. It does this by multiplying the CAP by the free-float and inflation-adjusted issuance of a given cryptoasset.

A. Free-Float Adjustment

It is common practice in equity indexes to remove any noncirculating shares from market-cap calculations. These include, for instance, government-held shares that are likely to never trade, and shares held by corporate Treasurys.

Adjusting cryptoassets for free float is necessary as well. Coins may launch with a large stated and potential issuance, but with a significant majority of supply held outside of the liquid market. For the purposes of its market-cap-weighted indexes, Bitwise will remove from consideration:

- i. All premined coins (coins that are allocated to developers of a project prior to the public release of that project) that remain in the control of developers, principals, foundations, or business entities affiliated with the creation of the cryptoasset.
- ii. Block grants of the cryptoasset that are formulaically given to the principals, foundations, or business entities affiliated with the creation of the cryptoasset.
- iii. Other factors as determined by the Bitwise Crypto Index Committee

Issuance will be returned to the free-float circulation in the event there is public announcement that assets have been sold into the public market.

Free-float adjustments are made on a monthly basis at 4 p.m. ET on the last business day of each month, and are set until the following month.

Explainer: This rule exists to ensure that the Bitwise Crypto Indexes capture the investable portion of the global cryptoasset market. They are set monthly both for

practical purposes and to ensure that the resulting indexes can be tracked by investable products in a reasonable fashion without daily rebalancing.

B. Five-Year Inflation Adjustment

Cryptoassets are different from traditional stocks and bonds, in that most assets have a built-in inflationary expectation; that is, the number of coins outstanding today is expected to change as new coins are mined, distributed, deliberately destroyed (burned), or intentionally and permanently lost from the network. The Bitwise Crypto Indexes account for future issuance by making a data-driven, conservative estimate of issuance five years in the future, and using that issuance in all market-capitalization calculations.

To determine the estimated outstanding issuance of each coin five years in the future, the Bitwise Crypto Index Committee takes the following cascading steps:

- i. **Programmatic:** If issuance is programmatically built into the network protocol, the index committee uses that rule-set to calculate the estimated five-year issuance.
- ii. **Guidance-Driven:** If issuance is not programmatic but there is either direct guidance from founders or widespread community agreement on the range of estimated inflation going forward, the Index Committee will use the most conservative reasonable estimate of future issuance to calculate the estimated five-year issuance.
- iii. **Default To Zero:** In all other cases, no additional issuance is included in the five-year forecast, and the current free-float-adjusted outstanding issuance is used.

Inflation adjustments are made on a monthly basis at 4 p.m. Eastern Time on the last business day of each month, and are set until the following month.

Explainer: This rule set exists to ensure that the Bitwise Crypto Indexes capture the community's aggregate view of the value of each cryptoasset. The use of a five-year time horizon (as opposed to either current issuance or terminal issuance) represents a realistic estimate of how investors discount long-dated future issuance back to fair value. Inflation adjustments are set monthly both for practical purposes

and to ensure the resulting indexes can be tracked by investable products in a reasonable fashion.

VI. BITWISE CRYPTO MARKET-CAPITALIZATION INDEXES

The Bitwise Crypto Market-Capitalization indexes aim to capture the total returns of leading cryptocurrencies grouped by free-float and inflation-adjusted market capitalization.

A. Available Indexes

- i. **Bitwise 10 Large Cap Crypto Index (BITX):** The Bitwise 10 Large Cap Crypto Index captures the 10 largest eligible cryptoassets by five-year inflation and free-float-adjusted market capitalization
- ii. **Bitwise 20 Mid Cap Crypto Index (BITW20):** The Bitwise 20 Mid Cap Crypto Index captures eligible cryptoassets ranked 11-30 by five-year inflation and free-float-adjusted market capitalization
- iii. **Bitwise 70 Small Cap Crypto Index (BITW70):** The Bitwise 70 Small Cap Crypto Index captures eligible cryptoassets ranked 31-100 by five-year inflation and free-float-adjusted market capitalization
- iv. **Bitwise 100 Total Market Crypto Index (BITW100):** The Bitwise 100 Total Market Crypto Index captures eligible cryptoassets ranked 1-100 by five-year inflation and free-float-adjusted market capitalization

B. Base Date and Base Level

The base date for all Bitwise Crypto Market Capitalization indexes, using backtested data, is January 1, 2017. The indexes share a common base level of 964. This level was arbitrarily chosen because it was the price of bitcoin in U.S. dollars at midnight UTC on that day.

The inception date for live data on the Bitwise 10 Large Cap Index is October 1, 2017. The inception date for live data on the Bitwise 20 Mid Cap Index, Bitwise 70 Small Cap Index, and Bitwise 100 Total Market Index is July 31, 2018. All data before these inception dates is backtested data.

C. Reconstitution and Buffer Zones

i. **Reconstitution:** The Bitwise Crypto Market Capitalization indexes are reconstituted at 4:00 p.m. Eastern Time on the last business day of each month.

Explainer: The selection of 4:00 p.m. Eastern Time on the last business day of the month is intended to ensure that the indexes are reconstituted at a time of normal trading liquidity.

ii. Buffer Rules

a. **Market Capitalization:** The Bitwise Crypto Market Capitalization indexes use a “5% market capitalization buffering rule” to limit unnecessary turnover. An eligible cryptoasset that is held in a given Bitwise Crypto Market Capitalization index will only be removed if there is an eligible cryptoasset that exceeds its inflation-adjusted, free-float market capitalization by 5% as of 4 p.m. Eastern Time on each of the five-consecutive days up to and including the Reconstitution.

Explainer: Buffer Zones are common practice in traditional asset indexing and are used as tools to reduce noneconomic switching of assets due to inconsequential or fleeting differences in market capitalization.

D. Real-Time Level and Daily Index Level

i. **Daily Index Level:** The Bitwise Crypto Market Capitalization indexes currently produce one official daily level at 4 p.m. Eastern Time. This level incorporates all network distributions that occur prior to the strike time.

This daily index level will be distributed each day by 5 p.m. Eastern Time, unless data or other issues preclude or delay the publication of an accurate price. In that event, Bitwise will distribute the daily index level as soon as reasonably possible.

Note: In the future, Bitwise reserves the right to produce indexes with alternate strike times for the daily index level if needed for regulatory or practical purposes.

ii. **Real-Time Level:** The Bitwise Crypto Market Capitalization indexes will distribute a “Real-Time Level” every 15 seconds of every day. This level does not incorporate the value of network distributions that occur between publications of the Daily Index Level.

The Real-Time Level should be considered an estimated level. Bitwise will make no attempt to correct or amend the Real-Time Level to adjust for network distributions or data corrections that occur, but rather, will amend current Real-Time Levels to reflect that information on a go-forward basis.

E. Total Return and Price Return Variants

All Bitwise indexes are available in both Total Return and Price Return variants. The Total Return variants incorporate the value of certain network distributions, while the Price Return variants only capture the returns of individual cryptoasset prices themselves.

The Total Return variant should be considered the standard index; when Bitwise refers to its indexes without disclosing variant, it should be assumed that the reference is to the total return variant. Bitwise will explicitly refer to the Price Return Index when it wants to highlight the Price Return Variant.

i. Treatment of Network Distributions by the Bitwise Crypto Indexes Total Return Variants

The Bitwise Crypto Indexes consider each type of network distribution in a distinct manner:

- **Hard Forks** are considered native developments in a given cryptoasset, which can be claimed with limited agency and have the potential to have a meaningful impact of asset returns. As such, if a constituent of a Bitwise Crypto index experiences a hard fork, the value of that fork is captured by the index.

When a hard fork occurs, Bitwise will evaluate that asset at 4 p.m. ET on the first day that it has a CAP. At that time, the Bitwise Crypto Index Committee will determine which of the following three buckets it falls into:

- If a newly forked coin has a free-float and inflation-adjusted market cap that is less than 0.05% of the overall index value, or if it fails to satisfy the core cryptoasset eligibility requirements laid out in section 3.B, it is ignored, as a way of limiting operational overhead.
- If the newly forked coin has a free-float and inflation-adjusted market cap large enough to satisfy the inclusion criteria of a given index, and it satisfies the other eligibility requirements laid out in section 3.B, it is retained by the index through the next monthly reconstitution. For instance, if a cryptoasset in the Bitwise 10 Large Cap Crypto Index forks and the newly forked coin would qualify as one of the 10 largest cryptoassets, it is retained until the next monthly reconstitution.
- If the newly forked coin has a free-float and inflation-adjusted market cap that is greater than 0.05% of the index but not large enough to qualify for continued inclusion in the index, and it satisfies the other eligibility requirements laid out in section 3.B, it is liquidated at 4 p.m. ET on the first day it has an official price. The proceeds from this liquidation are invested on a pro-rata basis in the other cryptoassets in the index.
- **Emissions** are native developments for certain cryptoassets. They are typically a separate and distinct cryptoasset that is distributed to holders of a given cryptoasset on a regular and sometimes-effectively-continuous basis. To date, the daily value of distributed emissions has been de minimis for any given cryptoasset. This fact informs the treatment of emissions by the indexes.

The Bitwise Crypto Indexes are designed to be investable and replicable. Given the small values involved, it would not be practical

for investment funds handling regular inflows and outflows to accurately track Bitwise Crypto Indexes if they accrued emissions on a daily basis, whether they hoarded those emissions over time or liquidated them daily. As a result, the Bitwise Crypto Indexes ignore emissions for index calculation purposes.

It is our expectation that funds tracking our indexes *will* accrue emissions and periodically liquidate them to deliver excess returns to shareholders.

Note: The Bitwise Crypto Index Committee regularly monitors the crypto ecosystem and may adapt a different treatment of emissions if the value of said emissions becomes significant.

Note also: The Bitwise Crypto Index Committee considers emissions different than staking rewards, which require agency and can involve liquidity restrictions. Because of the agency and potential risks involved, the Committee considers staking rewards akin to securities-lending revenue, and therefore not relevant to index valuation.

- **Air drops** are an important part of the crypto ecosystem. They are not, however, native to the internal return drivers of any given cryptoasset. Importantly, they also require agency on the part of cryptoasset holders to claim, and the act of claiming those assets can potentially put holders of a given cryptoasset at risk.

As such, and particularly given that most airdrops are of de minimis value (and often illiquid), the Bitwise Cryptoasset indexes do not incorporate their value into its indexes. It is our expectation that fund managers tracking the Bitwise Cryptoasset indexes may well take action to idiosyncratically claim valuable airdrops, and that the value of those airdrops will return to those funds as excess returns.