



Coinbase Index

Construction and Methodology

Version 1.1

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1 Introduction

Coinbase Index

- 1.1 Coinbase Index (“CBI”) tracks the combined financial performance of all of the digital assets listed for trading in the US region by Coinbase¹. The components of CBI are weighted by market capitalization, defined as price² multiplied by supply³.
- 1.2 CBI is designed to be a benchmark for the overall performance of its constituent assets. The index level for CBI takes into account the latest price and supply of each of its constituent assets.

About Coinbase

- 1.3 Founded in June of 2012, Coinbase, Inc. is a digital currency exchange platform where traders and investors can easily buy, sell and hold digital currencies. Coinbase, Inc. operates Coinbase Markets, a central-limit order book exchange for digital assets, which is the source of the price data for CBI.

¹ CBI does not track the overall performance of cryptocurrencies or digital assets, or any specific cryptocurrency or digital asset.

² Refer to section 2.6.

³ Refer to section 2.8.

2 Index Construction

Constituent Assets

- 2.1 The constituent assets of CBI are all the assets listed for trading in the US region by Coinbase. The criteria for assets to be listed by Coinbase can be found in the Coinbase Digital Asset Framework⁴.
- 2.2 There is no fixed number of constituent assets for CBI. The current constituent assets and their weightings can be found at <https://am.coinbase.com/index>.
- 2.3 New digital assets created through blockchain forks⁵ or airdrops⁶ will not be added to the index unless and until they are listed for trading in the US region by Coinbase. Each new asset must, in its own right, satisfy the criteria in the Coinbase Digital Asset Framework⁷ and be listed for trading in the US region by Coinbase in order to become a constituent asset of CBI.

Weighting

- 2.4 CBI constituent assets are weighted by their relative USD market capitalizations (sometimes referred to as 'total network value' in the context of digital assets). The weighting of a constituent asset in the index is its USD market capitalization divided by the aggregate of the USD market capitalizations of all the constituent assets⁸. The market capitalization of each constituent asset is calculated as the price⁹ of the asset multiplied by the supply¹⁰ of the asset.
- 2.5 CBI is weighted by market capitalization because it is the most objective overall measure of the financial performance of each of the constituent assets. Market capitalization represents the total value attributed to an asset by the digital asset

⁴ <https://listing.coinbase.com/policy>

⁵ A change to a digital asset's blockchain protocol that creates two separate digital assets on two separate versions of the blockchain with a shared history.

⁶ A distribution of a new digital asset to all hodlers of an existing digital asset at no cost.

⁷ <https://listing.coinbase.com/policy>

⁸ Refer to section 3.1.

⁹ Refer to sections 2.6 and 2.7.

¹⁰ Refer to sections 2.8 to 2.10.

market as a whole. It is the best available objective standard to compare the financial performance of digital assets¹¹.

Price

- 2.6 The price for each constituent asset is the last trade price on the Coinbase USD order book for that asset.
- 2.7 If trading is suspended for any reason, CBI will continue to be calculated based on the last trade price before trading was suspended¹². CBI will be calculated based on new trade prices once trading commences again.

Supply

- 2.8 The supply of each constituent asset is defined as the total number of units that have been created since the first block on the asset's blockchain. Supply is measured directly from the blockchain of each constituent asset, by querying a full node on that blockchain, maintained by Coinbase.
- 2.9 The supply of many digital assets increases on an ongoing basis, as defined by each asset's blockchain protocol. These supply increases are usually referred to as block rewards or miner¹³ rewards — new units of the asset that are programmatically issued as a reward to network validators. These increases in supply have the potential to increase the market capitalization of the asset. CBI recognizes the effect of these increases by using the most recent supply figure for each asset in calculating the index level.

¹¹ For some digital assets, market capitalization may not be an accurate measure. For example, where there is a very small number of currently issued units relative to total units to be issued in the future, or where very low trading volumes mean it is not possible to buy or sell a substantial amount of the asset at the current market price. However, given the criteria in the Coinbase Digital Asset Framework, these issues are not expected for assets which are listed by Coinbase.

¹² Refer to section 4.3 about extended unavailability of a data source.

¹³ The validators on a proof-of-work blockchain are usually referred to as miners.

2.10 CBI does not make any adjustment for units of an asset that have been lost or sent to provably unspendable addresses¹⁴, or use a free float adjustment¹⁵. Unlike traditional assets, for digital assets it is difficult to objectively determine the number of units actually available for purchase by investors, because there is no record of identity of the owners or holders of each asset. Therefore, it is difficult to determine whether or not any particular unit of an asset is held ready for trading on the market. For example, the private keys corresponding to the public address of those units could be lost or destroyed, meaning that these units are not available for trading. Therefore CBI reflects total current supply, without adjustment.

Divisor and Base Value

2.11 The Divisor is the USD market capitalization of all constituent assets as at January 1st, 2015, subject to all previous divisor adjustments.

2.12 The index start date is January 1st, 2015. This date represents the launch of Coinbase's first central limit order book exchange. Because Bitcoin was the only constituent asset as at January 1st, 2015, the base value is equal to the market capitalization of Bitcoin at that time (USD \$4,337,808,289) meaning that the index level on that date was 100.

Publication

2.13 CBI will be calculated and published at <https://am.coinbase.com/index>.

2.14 The historical CBI daily level (as of 5pm Pacific Time each day) commencing January 1st, 2015 will be also available at <https://am.coinbase.com/index>.

¹⁴ On most blockchains it is possible to send units of the asset to public addresses that cannot be spent, taking them out of circulation permanently. This is sometimes referred to as 'burning coins'.

¹⁵ An adjustment to exclude shares that are not available for purchase by investors.

3 Methodology

Calculating the Index Level

- 3.1 The index level for CBI is calculated by dividing the sum of the current USD market capitalizations of all constituent assets by the Divisor and multiplying the result by 100. This calculation can be expressed as follows:

$$CBI = \left(\frac{\sum_i (P_i \times Q_i)}{D} \right) \times 100$$

Where:

- i, ii, \dots = Each constituent asset
- P = Last trade price on the Coinbase USD order book for the asset
- Q = Total number of units of the asset that have been created on the asset's blockchain since the first block
- D = The base value, after adjustment for all previous reconstitutions¹⁶

Reconstituting the Index

- 3.2 CBI will be reconstituted each time that a new asset is listed for trading in the US region by Coinbase, in order to allocate the correct weight to each constituent asset and to prevent an artificial increase in the index level. Each reconstitution will occur at the first trade immediately following 5pm Pacific Time on the fifth day that the new asset is listed. This is designed to reduce the effect of any temporary price volatility in the new asset in the first few trading days after its listing.

¹⁶ Refer to sections 2.11, 2.12, 3.2 and 3.3

- 3.3 The index level can be calculated upon reconstitution by including the new asset when calculating the index level (see above), and updating the Divisor according to the following formula:

$$D_{t+1} = D_t \left(1 + \frac{VWAP_x \times Q_x}{\sum_i (P_i \times Q_i)} \right)$$

Where:

- i, ii, \dots = Each constituent asset before the reconstitution
- x = The new asset
- P = Last trade price on the Coinbase USD order book for the asset
- $VWAP$ = Volume-weighted average price on the Coinbase USD order book for the asset for the 120 hours ending immediately prior to reconstitution
- Q = Total number of units of the asset that have been created on the asset's blockchain since the first block
- D_t = Existing Divisor
- $D(t+1)$ = New Divisor

- 3.4 If an asset ceases to meet the eligibility criteria, the Divisor will be reduced by the same proportion that the market capitalization of the delisted asset bore to the numerator immediately before the asset ceased to meet the eligibility criteria.

4 Index Committee Oversight

Membership

- 4.1 The Coinbase Index Committee consists of Coinbase subject matter expert employees. All Coinbase employees are subject to the Company's Employee Trading Policy and Code of Business Conduct.
- 4.2 In addition, members of the Coinbase Index Committee must declare their holdings of digital assets, and are subject to enhanced trading restrictions including pre-clearance requirements.

Responsibilities

- 4.3 The Coinbase Index Committee is responsible for:
- Reviewing the accuracy and availability of data sources
 - Reviewing calculations of the index level for anomalies
 - Determining whether, in exceptional circumstances, the index level will be calculated or recalculated from different data sources. For example, if one or more data sources is unavailable for an extended period. In that case, the Committee will, if possible, use the US-based spot exchange with the most volume over the past 30 days on the USD order book for each constituent asset.
 - Determining whether, in exceptional circumstances, it is necessary to recalculate the index level for a particular period. For example, if one or more data sources is discovered to be inaccurate.
 - Determining whether, in exceptional circumstances, a change to the index methodology is required.
 - Publishing the outcome of any such extraordinary events or adjustments noted above on the Coinbase Index website at <https://am.coinbase.com/index>

5 License and Use

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6 Version History

Version	Release Date	Notes
1.0	March 6, 2018	Original version
1.1	October 3, 2018	Removed Coinbase Index (Fixed Supply) Removed list of Current Constituent Assets Removed Divisor History Amended role of Index Committee Removed requirement for publishing Committee minutes and Index Changes